THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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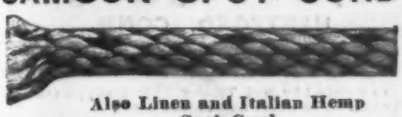

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THE IRON AGE

New York, Thursday, February 9, 1905.

The Willey Motor Driven Tools for Electrical Manufacturing.

In previous issues of *The Iron Age* have been described a number of the electrically driven tools which form part of a line manufactured by James Clark, Jr., & Co., Louisville, Ky. These machines are rather original in design, as the motor is in nearly every case incorporated in the machine in such a manner that the frame of the machine forms part of the magnetic circuit of the motor. The motor is well protected by such an arrangement and is more out of the way than would be possible were it attached to a bracket on the exterior of the machine. The earlier articles which have been referred to appeared in the issues of July 21, September 1 and September 22, 1904, and showed respectively a motor driven radial drill, motor driven grinders and motor driven sensitive and small drills. The present article shows two more of the Willey motor driven tools, these being particularly designed for electrical manufacturing purposes. Fig. 1 shows an armature disk notching machine and Fig. 2 a coil winding machine.

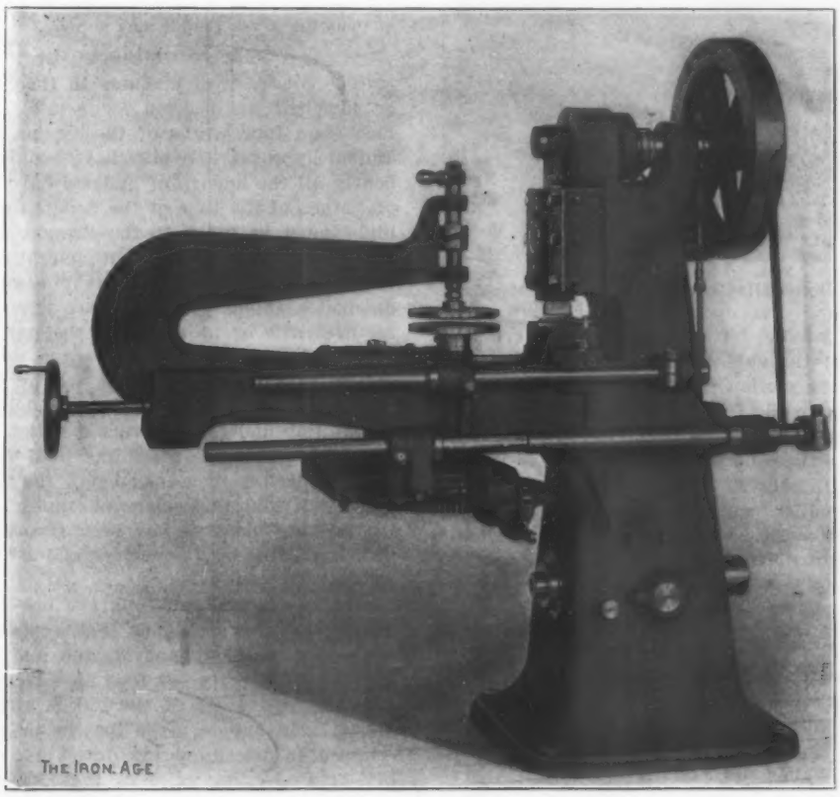


Fig. 1.—Willey Electrically Driven Armature Disk Notching Press. Made by James Clark, Jr., & Co., Louisville, Ky.

The armature disk notching machine was designed by the company originally for its own use, as it has occasion to use a number of these machines in the manufacture of its motors. Like most of the Willey motor driven tools the motor is built into the fame—in this case in the base. It is of bipolar form with iron clad armature and is fitted with carbon brushes, form wound field coils, steel pole pieces and self oiling bearings. The removable cover plates in the frame give access to the parts of the motor when they require attention and inspection.

The indexing mechanism is very simple and not likely to get out of order. The index plates are held in position by a nut and taper dowel pin, so that they will always go back to exactly the same place; consequently any disks punched at one time will match those punched at another time. The index plates are operated by a pawl driven from a slotted crank disk on the end of the main shaft, which can be quickly adjusted for different lengths of stroke. The locking pin, actuated from a cam on the main shaft, secures the index wheel in position while the punch is cutting and insures each notch being correctly indexed. When the disk has traveled one revolution and all of the notches have been cut the machine is stopped by means of an automatic fixture.

One of the principal features of the machine is the convenient arrangement of the shafts that operate the indexing mechanism and the automatic stop. These shafts are parallel with the ways on which the index head is carried, and the change for a different diameter of disk can be made very quickly by loosening the clamping screws, moving the head to the desired position and tightening the screws. The disk clamping device allows work to be put in and taken out without loss of time and the disks are held securely.

All of the principal bearings of the machine are bushed, so that they can be renewed when worn. The machine is capable of notching plates from 6 to 48 inches in diameter. It weights complete about 1500 pounds. The motor has a maximum capacity of 1 horse-power and is wound for either 110 or 220 volts direct current.

The electrically driven winding machine shown in Fig. 2 was designed for winding various coils used in the construction of electrical machinery. This machine also, as will be seen, is self contained, the driving motor being within the frame and its fields being a part of the frame.

The operating handles are within easy reach of the operator. The movements of the winding spindle are controlled by the foot lever shown, and the spindle can be instantly stopped or started when running at full

speed, or revolved intermittently by small amounts, as desired. When the spindle is stopped it is prevented from running back and loosening the wire by a brake, which is applied on the instant the clutch is released. Connected with the spindle is a revolution counter which records the number of turns of wire placed on the coil. The carriage is provided with a guide for the wire and has automatic feed in both directions. This feed is driven by a friction disk and wheel and can be adjusted to suit any size of wire by means of the small crank shown near the top of the frame. The handle at about the middle of the frame controls the motor. The carriage has a rapid hand feed movement for quick adjustment. The handle for adjusting the carriage is geared to the nut through which the feed screw runs, thus permitting the motion of the carriage to be accelerated or retarded while feeding to compensate for any inaccuracy in the setting of the feed. Speed changes are made by means of the cone pulleys.

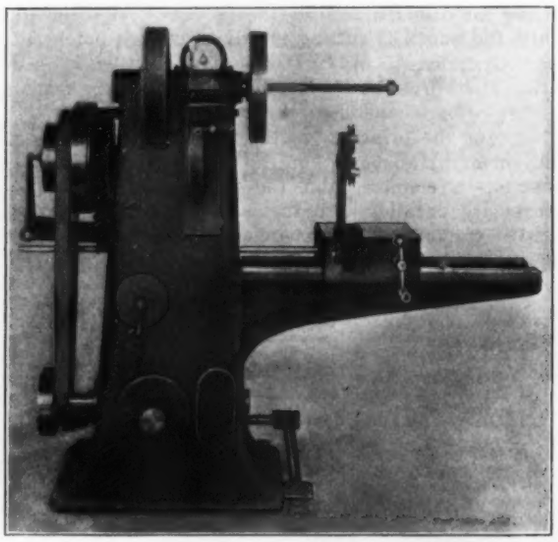


Fig. 2.—Willey Electrically Driven Coil Winding Machine.

The machine illustrated will wind coils of wire of No. 5 size and smaller, while for heavier wire the machine is provided with back gears to give additional power. The weight of the machine shown is about 900 pounds. The motor has a capacity of 1 horse-power and may be wound for either 110 or 220 volts.

The Scranton Bolt & Nut Company.—At the annual meeting of the Scranton Bolt & Nut Company, held at Scranton, Pa., the following directors were elected: W. D. Zehnder, C. H. Zehnder, L. M. Horton, E. M. Zehnder, C. C. Rose, O. H. Welles and Frank Lawall. W. D. Zehnder was re-elected president; C. H. Zehnder, vice-president; L. H. Horton, secretary and treasurer; E. M. Zehnder, superintendent, and Frank B. Rutter, assistant superintendent. The report of President Zehnder was especially gratifying, as it showed a large amount of business and that the company's management was keeping in close touch with its employees. The works were in operation 275 days during the year, and 450 men were employed steadily. A considerable quantity of new machinery was installed to keep the plant up to its standard of efficiency.

The American Minister to Panama has submitted to the State Department a report which shows the actual construction on the Panama Canal accomplished since July 1, when Mr. Wallace took charge of the engineering department. The most important statement in the report is this: "If the next six months show a progress corresponding to that of the past six, it is the conviction of the best engineers on the Isthmus that a sea level canal can be constructed in ten years and be ready for large vessels by January 1, 1915." The report declares that there is no ground for the current reports that little has been accomplished in advancing the construction of the canal during the past six or eight months.

Merchant Marine Legislation Postponed.

WASHINGTON, D. C., February 7, 1905.—The advocates in Congress of legislation for the relief of the American merchant marine have reluctantly abandoned the campaign so far as the present session of Congress is concerned, and the bill prepared by the Merchant Marine Commission and introduced by Senator Gallinger has been indefinitely postponed. The decision not to press the subject further at this session has been reached with much reluctance, but in view of the advanced stage of the session, the congestion of public business and the hostile attitude of the opponents of the proposed legislation, it is universally conceded that it would be a waste of effort to pursue the matter further. Under these circumstances Senator Gallinger a day or two ago made the following formal announcement in the Senate:

> I had hoped to call up for consideration this bill, which was reported by the Merchant Marine Commission. But the chances for doing so are certainly not very flattering at this session. I have received a great many letters from different parts of the country, from shipowners and shipbuilders, assuring me that if the bill should be passed they would proceed to construct new American steamships, and it would do a great deal to rehabilitate the American merchant marine. Satisfied that the bill cannot receive the consideration it deserves at this session of Congress, I ask that it may go over.

The Situation in the Senate.

The condition of business in the Senate would alone be sufficient justification for Senator Gallinger's action. Less than four weeks of the session now remain. The annual appropriation bills have been much delayed, and nearly all the important budgets have yet to be disposed of. Much of the time of the Senate during the next fortnight must be given to the Swayne impeachment trial, while a number of important general measures are being energetically urged for the advantageous position of "unfinished business." Under these circumstances it would require little or no effort on the part of the opponents of the Gallinger bill to prevent a vote upon it, and a coterie of minority Senators led by Senator Bailey of Texas stands ready at all times to debate the proposition indefinitely and thus prevent a ballot. The rules of the Senate preclude the possibility of a vote as long as any Senator desires to speak; hence the friends of the Gallinger bill find themselves absolutely helpless, although the pending measure has been favorably reported from the Committee on Commerce, and is strongly supported by the Administration.

In the House conditions are hardly more favorable. The commission's bill has been reported from the Committee on the Merchant Marine and Fisheries, but an aggressive minority has filed an adverse report in which the subsidy feature of the bill is strongly antagonized, and the demand is made for the passage of a measure confined to discriminating duties and increased tonnage taxes. Under the rules of the House it would not be difficult to pass a bill with the aid of a special order from the Committee on Rules limiting the debate, cutting off amendments and fixing a time for a vote, provided the majority in the House could be brought solidly into line for the measure. Unfortunately, however, a number of Republican members from the Northwest are lukewarm on this subject, if not actually opposed to the bill. In addition, Speaker Cannon regards with suspicion, if not positive disfavor, any measure the passage of which would involve the expenditure of an extra dollar, no matter what the ultimate results might be, and hence the situation cannot be said to justify an application to the Committee on Rules for a special order.

In spite of the discouragements encountered at this session, the leaders in the movement for the relief of the merchant marine are by no means downcast. The work of the commission has been productive of very satisfactory results, and the pending measure is believed to be not only the most conservative but the most effective of any of the kindred propositions brought forward in the past decade. It is proposed to reopen the fight as soon as Congress reconvenes, either in regular or extraordinary session, when, owing to the indefinite length of the session, filibustering tactics would be futile and

a vote in both houses would be assured. The passage of the measure whenever a vote is reached is a foregone conclusion.

A Commission on Marine Construction.

The Department of Commerce and Labor has prepared a bill, which has been introduced in the Senate by Senator Frye and in the House by Representative Grosvenor, which is of special interest to the shipbuilders of the country, and which has an important bearing upon the expansion of the merchant marine. This measure provides for the appointment of a Commission on Marine Construction to investigate the subject of the form of construction and material of all vessels coming under the jurisdiction of the navigation laws, and while one of the principal objects is to guard against accidents or loss of life, it is proposed that the inquiry shall have the widest possible scope, and that the recommendations of the commission shall be promtly enacted into law. The text of this bill is as follows:

Be it enacted, &c.—That a commission is hereby created, to be called the Commission on Marine Construction, to be composed of five members appointed by the President, by and with the advice and consent of the Senate, each commissioner to be experienced in the building of ships, especially ships propelled by steam, and otherwise possessed of expert knowledge on the subject of marine construction.

Sec. 2. That it shall be the duty of this commission to investigate the subject of the form of construction and material, including safety equipment and maximum passenger allowances, of steamboats, including ocean steamers, and vessels subject to the jurisdiction of the Department of Commerce and Labor, and to make full report thereon to the Secretary of Commerce and Labor, and to recommend to said Secretary such legislation or regulations as it may deem necessary, such legislation and regulations to have in view the prevention of marine disaster and consequent loss of life by fire or other cause.

Sec. 3. That the commission shall give reasonable time for hearings if deemed necessary; that it shall have authority to send for persons and papers and to administer oaths and affirmations; that its place of meeting shall be at the headquarters of the Department of Commerce and Labor, Washington, D. C., but that it may make investigations in any part of the United States under the supervision of the Secretary of Commerce and Labor.

Sec. 4. That each commissioner shall be entitled to receive a salary for his services while actually engaged upon the work of the commission, the amount of which shall be determined by the Secretary of Commerce and Labor, and all the actual and necessary expenses of the commission, including expert assistants, clerks, stenographers, messengers, rent for place or places of meeting, printing and stationery, and actual and necessary traveling expenses shall be paid, under the direction of the Secretary of Commerce and Labor, from any money in the Treasury not otherwise appropriated; provided, however, that not to exceed $100,000 shall be expended under this section.

Sec. 5. That this act shall take effect and be in force on and after July 1, 1905.

The President and the Secretary of Commerce and Labor are personally urging the passage of this bill, which they hope will become a law before adjournment on March 4.

W. L. C.

The McKeesport Tin Plate Company.—The annual meeting of this company was held in McKeesport, Pa., recently, at which Edward R. Crawford was elected president, E. P. Douglass vice-president, H. M. Clark secretary, Enoch W. Pitts treasurer and J. E. Lauck general manager. The annual report was submitted showing that the plant with the exception of two days was in full operation from January 18 to December 31, 1904. During that time 21,539 tons of black plate were rolled, the company turning out 426,020 base boxes of tin plate and selling in the open market black plate equivalent to 43,878 base boxes of tin plate, making its total output of black plate equal to 469,898 base boxes. The company during 1904 paid out in wages $360,178.50, and a dividend of 3 per cent. was declared out of the earnings, this being the first dividend declared. The plant has been operated for about three years.

The Harrison Safety Boiler Works is located at Seventeenth street and Allegheny avenue, Philadelphia, Pa., and not at Harrison, Pa., as incorrectly stated in an article printed in *The Iron Age* of February 2, headed "Open Feed Water Heaters in Connection With Steam Turbines."

The Chicago Pneumatic Tool Company.

In his annual report to the stockholders President J. W. Duntley of the Chicago Pneumatic Tool Company explains the poor showing of earnings by reference to the industrial depression of 1903 and 1904. Earnings greatly improved in the closing months of 1904. Mr. Duntley says that while no action was taken on dividends at the recent meeting of the directors in New York, the board is agreed upon a proposition to resume quarterly dividends in April, probably at the rate of 4 per cent. a year.

The detailed statement of earnings for the year follows:

	1904.	1903.
Net profits	$470,579	$701,464
Depreciation, repairs and renewals	85,888	129,329
Balance	$384,691	$572,135
Bond interest	115,000	115,000
Sinking fund	50,000	50,000
Total deductions	$165,000	$165,000
Balance	$219,691	$407,135
Dividends	.....	361,979
Surplus	$219,691	$45,156
Extra legal and patent expenses	17,631	45,156
Developing new lines of tools	6,736	.....
Total extra expenses	$24,367	$45,156
Surplus	$195,324	.....

This surplus is equal to a little over 3 per cent. on the outstanding capital stock. There was deducted from this surplus, however, $55,000 to apply on the cost of the new plant in Scotland.

The balance sheet as of December 31 compares with the one of the preceding year as follows:

	1904.	1903.
Assets.		
Real estate, buildings, plant, patents and good will, less reserves	$6,343,118	$6,344,206
Capital stock of other corporations at cost	1,216,109	1,119,125
Cash	174,193	120,790
Accounts and bills receivable, less reserves	551,832	578,287
Inventory, material, finished work and in process	541,522	532,888
Sinking fund invested	177,100	120,875
Totals	$9,003,874	$8,816,171
Liabilities.		
Capital stock issued	$6,113,800	$6,032,900
First mortgage bonds issued	2,300,000	2,300,000
Interest on bonds due January 1	61,526	*103,832
Accounts payable	94,716	127,864
Sinking fund for redemption of bonds	177,100	120,875
Reserve for taxes and suspense items	2,702	16,994
Surplus	254,030	113,706
Totals	$9,003,874	$8,816,171

* Includes dividends unpaid.

The General Engine Company, which was reorganized last April to manufacture the Hoffman rotary engine, has increased its capitalization to $2,000,000, of which a sufficient amount has been paid in for the construction of an initial plant in Buffalo, N. Y., for the manufacture of the new type engine upon a large scale. A site has been secured and a factory is being erected, so arranged as to be added to or expanded as occasion may require, and a 500 horse-power Hoffman rotary engine will be installed to furnish motive power for its operation. The company has received inquiries during the past month for engines of this type aggregating over 70,000 horse-power.

The Iroquois Electric Company, Buffalo, N. Y., has been incorporated with a capital stock of $1,000,000, the directors being Gen. Francis V. Greene, Edmund Hayes, William H. Hotchkiss, George K. Birge, William H. Gratwick, R. K. Albright and Stephen M. Clement, all of Buffalo. The main purpose of the organization of this company is to supply electricity for lighting, heat and power in the city of Buffalo. It will become a competitior of the Buffalo General Electric Company and the allied Cataract Power & Conduit Company all along the line. The power will be supplied by the Ontario Power Company, whose plant is located at Niagara Falls, Ont. The first 30,000 horse-power of energy will be ready for delivery on July 1 of this year.

Building Trades Workmen Organize in New York.

What is probably the largest central body of unions in the building trades ever formed in the United States effected a permanent organization last week in New York City under the name of the Associated Building Trades. A constitution was adopted and officers elected, as follows: President, Thomas A. Hughes of the Amalgamated Sheet Metal Workers' Union; vice-president, John Follam of the Plasterers' Helpers' Union; secretary, D. R. Tompkins of the Tile Layers' Union; treasurer, William O'Neill of the Tar, Felt and Water Proof Workers' Union, and sergeant-at-arms, Arthur Dunn of the Progress Association of Steam Fitters' Helpers. The new body represents 33 unions in the building trades, embracing both skilled and unskilled labor, with an aggregate membership of about 75,000, which makes it a much stronger body than either of its predecessors, the old Board of Building Trades and the Building Trades Alliance. The only union of any importance connected with the building trades not so far represented in the new organization is the Housesmiths' and Bridgemen's Union. Strong efforts, however, are now being made to bring this union also into the central organization.

The Associated Building Trades differs from the old organizations which it succeeds in that it is not composed merely of walking delegates, but is made up of five representatives from each affiliated union, with an inner organization termed the Board of Representatives, which acts as a kind of Executive Committee. This committee will order strikes only when empowered to do so by the Associated Building Trades. The constitution of the new organization includes provision for arbitration with the statement that strikes will only be undertaken as a last resort. It is understood that a committee from the organization will shortly wait on the Building Trades Employers' Association to demand a conference in order to formulate a new arbitration agreement and to end the present lockout which exists in connection with some of the unions. In case of failure to come to an agreement on these heads it is understood that arrangements will be made for a stubborn fight this spring.

The New Bliss Automatic Saw Tooth Notching Press.

For rapidly cutting the teeth of circular disk saws the machine shown in the accompanying illustrations has recently been designed by the E. W. Bliss Company, Brooklyn, N. Y. Samples of the work are shown beside the machine in each of the views, Figs. 1 and 2. The machine is adapted for cutting the teeth of various sizes on saws of different diameters and embodies several new and important features.

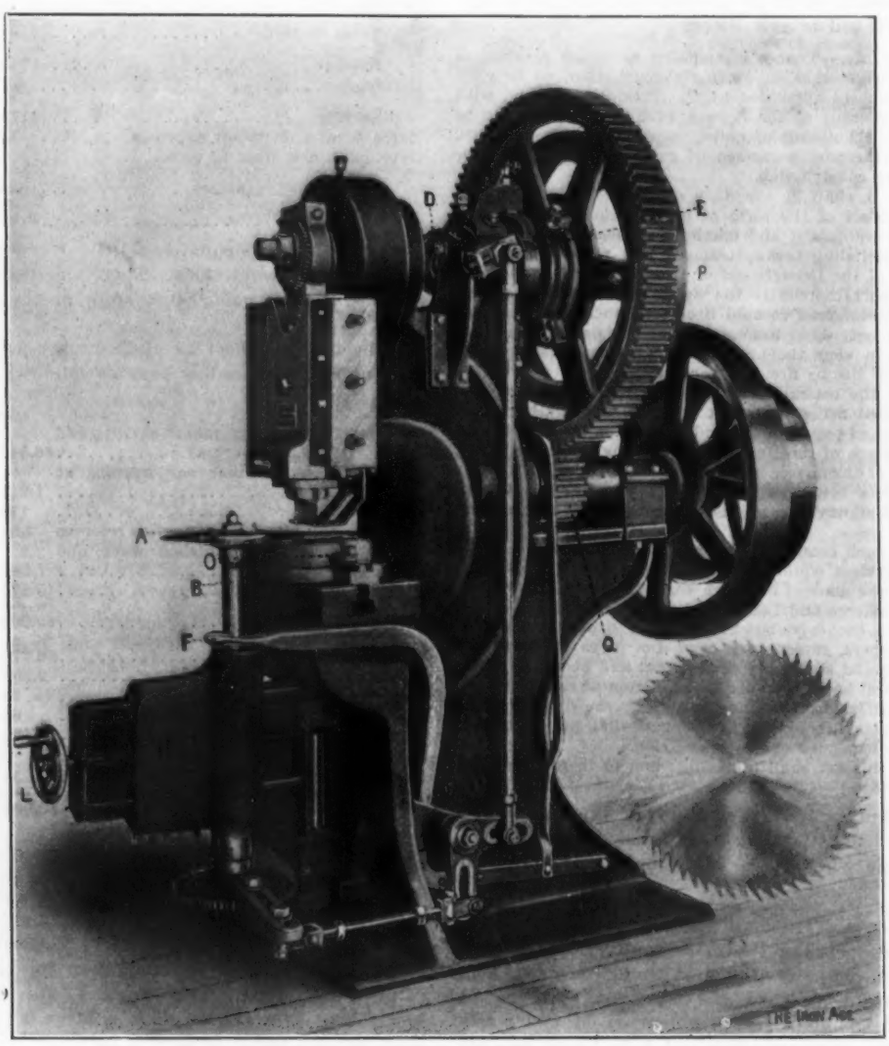


Fig. 1.—The New Bliss Saw Tooth Notching Press, Showing Feeding Mechanism.

After the dies have been set and the press adjusted for the work the operation is as follows: A plain blank, A, Fig. 1, is clamped between two disks, which are fastened to the revolving spindle B. This spindle is rotated by the ratchet wheel C, which is actuated through a series of levers and cranks by a pair of bevel gears, D, on the main shaft. The crank E has an adjusting screw for altering its throw, so that it may be accurately set for spacing the saw teeth to the required pitch. Approximate settings may be obtained by adjusting the ends of the connecting rods in the slotted bell crank and pawl lever, the final adjustment being made through the screw

in the crank E. Depressing the hand lever F sets the machine in operation, causing the saw disk to revolve and the punch slide to descend, cutting a tooth at each stroke of the machine.

A particularly desirable feature in the machine is the ease with which its setting may be altered from one size disk to another. Heretofore it has been necessary to remove a considerable part of the mechanism to change the indexing device. In this machine the indexing device C is placed at the extreme lower end of the spindle, where it can be easily removed by taking off one nut and a washer. To accommodate a different size disk the spindle carrier H is moved from or toward the punch by the hand wheel L. The carrier support K, as shown in Fig. 2, is hinged at M, so that the teeth of the saw may be punched at the proper rake or angle. The table is secured in position by a clamping bolt in the fixture just beneath the lower die bed, engaging in the slot of a bracket bolted to K, as shown in the left side view of the machine, Fig. 2. The slots in the levers of the feeding mechanism are made use of to compensate for the swinging of the table.

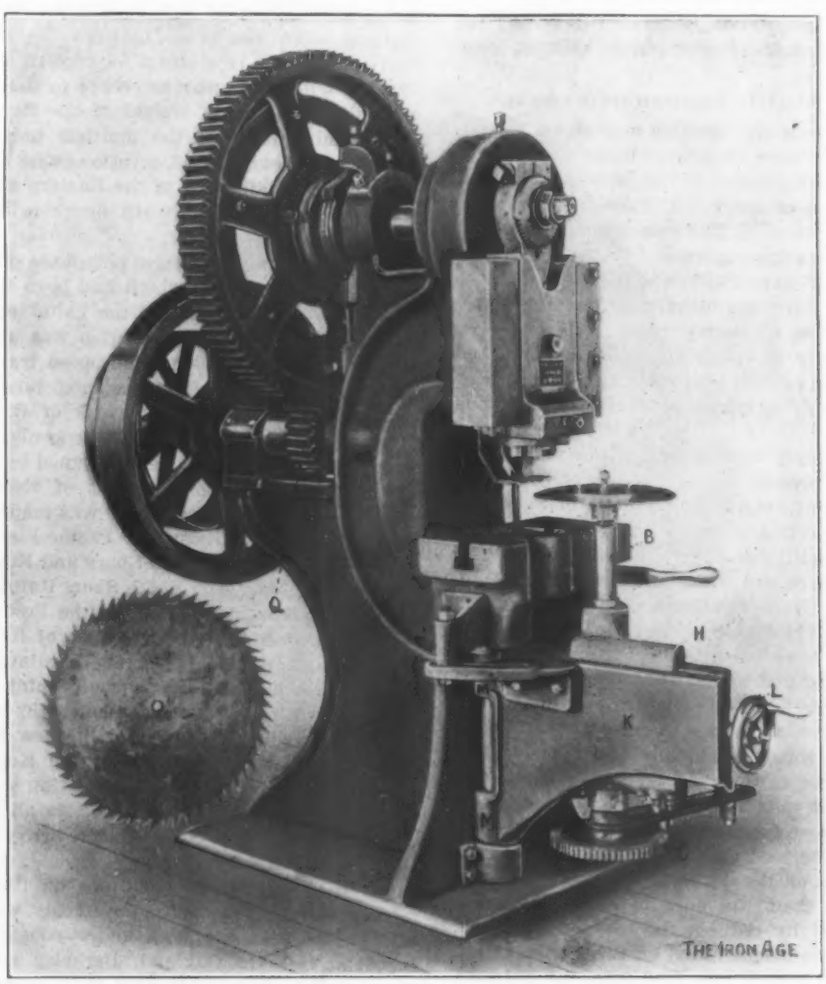


Fig. 2.—The Opposite Side of the New Bliss Saw Tooth Notching Press, Showing Swinging Table.

The machine will cut teeth on disks of 8 to 24 inches diameter, and will cut from the largest teeth to 16 teeth to an inch. The die and punch holders also have adjustments for setting them at any desired angle, making it possible to set the machine at practically any angle required in saw tooth punching of this class.

The machine is so arranged that saws of small diameters and light gauge may be cut with the press driven as a fly wheel press by placing the belt on the pulley rim P, which is fastened to the main gear. The gear in this case acts as a fly wheel, and the pinion Q and the regular driving pulley and fly wheel are thrown out of action. With the first arrangement the press runs at 80 strokes per minute and when geared at 40 strokes per minute.

The Philadelphia Foundrymen's Association.

The regular one hundred and forty-fourth meeting of the Philadelphia Foundrymen's Association was held February 1 at the Manufacturers' Club in that city. Thomas Devlin, the president, called the meeting to order at the usual hour. Dr. E. E. Brown, one of the visiting representatives of the association to the annual meeting and dinner of the New England Foundrymen's Association at the Exchange Club, Boston, on a recent date, spoke of their trip and the hospitality they enjoyed and presented to the Philadelphia Association a fine etching, framed and suitably inscribed, of the Old North Church of Boston, a gift of the New England Association. The gift was received by the president on behalf of the association, and a motion was passed that a letter of thanks be forwarded to the New England Association for its beautiful as well as historical gift.

The report of the treasurer showed the association to be in good financial condition, $2129.99 being in the treasury, with all bills paid.

The paper of the evening was read by Edwin A. Moore, president of the American Coke & Gas Construction Company, Camden, N. J., the subject being "By-Product Coke as Made by the Coke Oven Plants of the Otto-Hoffman and United-Otto Types." Mr. Moore's paper covered the construction of plants and description of the processes and was illustrated by numerous lantern slides and drawings. He also extended an invitation to the members to visit the Camden plant of the company and inspect its practical working. At the conclusion of his paper Mr. Moore was tendered a vote of thanks, after which the meeting adjourned.

J. Vollkommer of Pittsburgh, consulting engineer, has just sailed for Germany on a business trip.

Pacific Water Powers for Electric Railroads.

"The Use of Pacific Coast Water Powers in the Electrical Operation of Railroads" was the full title of an interesting paper read before the Pacific Coast Railway Club on January 21 in San Francisco. The paper was presented by Robert McF. Doble, consulting engineer of the Abner Doble Company, San Francisco, and was illustrated with stereopticon views and diagrams of steam locomotives, electric cars and locomotives, track and rolling stock of California roads, hydro-electric plants and a State map showing the location of power plants and transmission lines. Attention was called to the widespread consideration that is being given to the application of electricity as motive power to replace steam locomotives on railroads, reference being made to the large undertakings of this nature now being carried out by the New York Central and the Pennsylvania railroad companies.

Advantages of Electric Traction Over Steam.

The advantages of electric traction over steam for the operation of railroads were considered under three heads —namely: 1. Those appealing to the passenger and resulting in an increase of traffic. 2. Those pertaining to the centralization of power. 3. The economies in first cost, maintenance and operating expenses. Under the advantages to the passenger were mentioned the freedom from dirt and smoke, the universal cleanliness and the better ventilation and lighting of electric cars. Reference was made to the possibility of obtaining higher average and maximum speeds with electric operation and to the greater tractive effort resulting from the increased weight on the driving wheels.

Under the advantages of a central power station the author spoke of the present day limitations of the steam station and of the self evident possibilities of obtaining power from hydro-electric plants. Particular reference was made to the conditions on the Pacific Coast, where available water powers are distributed at frequent intervals all the way from Southern California up into British Columbia. While only a very small portion of these water powers have been developed, even with the stations now operating and the transmission systems now carrying power throughout the central portion of the State, the conditions would seem to make profitable the operation of at least some of the railroads by electricity. It was stated that the capacity of the steam locomotive has to be that of the maximum effort required from it, even though that effort be for a very short time, while, on the other hand, the load on the power station is only the sum of the loads on the different motors, which will average much less than the sum of their maximum powers. This materially reduces the cost of operating, especially with the conditions found on the Pacific Coast, where several power plants can feed into one network and supplement the power of each other. The possibility of recovering energy lost in braking was also referred to, the example of several European railways being cited to emphasize the fact that this has been practically accomplished. In such a system of distribution as is possible in California considerable power might be generated by trains descending mountain divisions and thus fed back and utilized in the distribution network.

Under the third heading reference was made to the saving in the cost and maintenance of track, the possible increase in capacity of existing railroads, the saving of time and labor in the operation of an electric locomotive, its characteristic simplicity and the rapidity with which repairs can be made. The power which can be obtained from steam locomotives is rapidly approaching its limit, while the development of the electric locomotive has apparently only begun. The relative reliability of the steam and electric motor was held to be in favor of the latter, especially in consideration of the local conditions in California, where a number of water power plants feeding into the same distribution system would make exceedingly remote the possibility of breakdown of anything more than an individual locomotive, and the chances for that were only half those for the steam locomotive.

For comparison Mr. Doble next considered briefly some of the typical modern steam locomotives, such as those of the Southern Pacific Company, the four-cylinder balanced compound 3000 type of the New York Central and the large Mallet articulated compound built for the Baltimore & Ohio Railroad.

Electric Locomotives and Systems of Currents.

After some general observations on the development of electric traction with special reference to its growth in California the author took up the discussion of several different types of electric locomotives using direct current, particular mention being made of those built for the Baltimore & Ohio and the New York Central railroads. The 6000 New York Central electric locomotive was described in detail, attention being called to its interesting electrical features and to its remarkable power and speed qualities as developed in the recent tests. Comparisons were also made between the electric and the heaviest Atlantic type steam locomotive of the New York Central, with particular reference to the increased draw bar pull per pound of weight of the former.

The advantages of the multiple unit direct current system were next treated, mention being made of some of the typical installations in the Eastern States as well as of the Key Route and North Shore railroads near San Francisco.

Under alternating current polyphase systems Mr. Doble discussed the progress which had been made along that line in Europe and described the Valtellina, Jungfrau and Burgdorf-Thun systems. Mention was also made of the remarkable Berlin-Zossen high speed trains.

Single phase systems were next taken up, attention being called to the pioneer work of B. J. Arnold, the General Electric and Westinghouse systems and their special features and the system designed by J. H. Hallberg.

Turning to the achievements of electric traction in California particular reference was made to the Los Angeles & Redondo Railway, the Pacific Electric Railway of Los Angeles and the North Shore and Key Route systems of San Francisco. The North Shore Railroad is of special interest by reason of its being the first and only third rail line in California and because of its being operated from a substation which is the terminus of one of the longest transmission lines in the country. The Alto station referred to is 180 miles from the hydro-electric plant at Colgate and 250 miles from the new De Sabla power house. One of the features of the Key Route system which was given considerable attention was the Diamond trolley, which is successfully used on all its trains. The possibilities of this collector for heavy railroad work were pointed out.

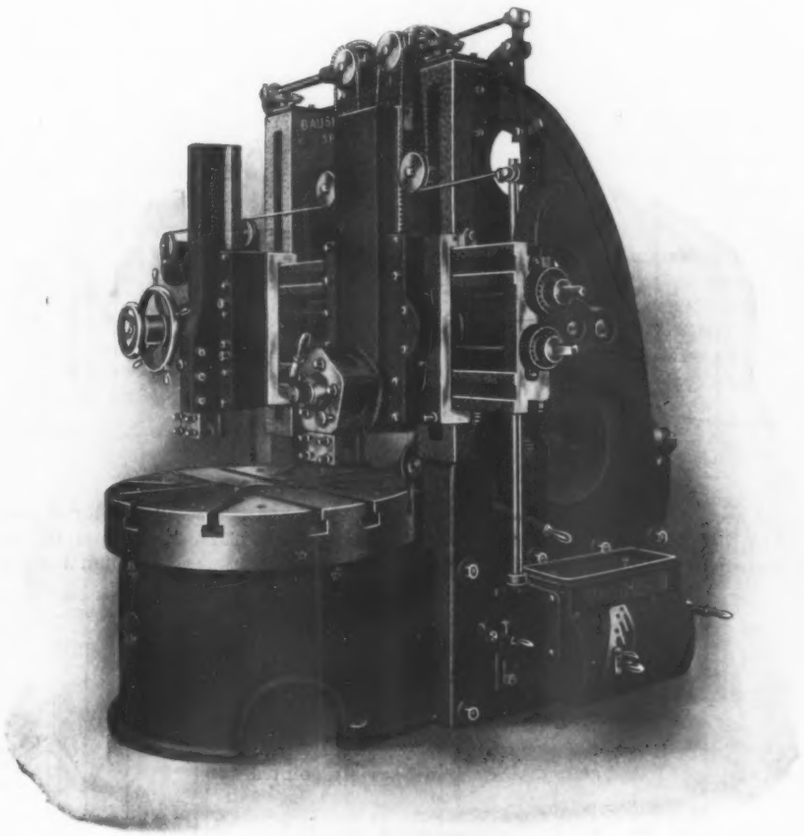
As to projected electric lines on the Pacific Coast, reference was made to improvements which the Southern Pacific Company has under consideration for its suburban lines in Oakland, Berkeley and Alameda, to the rumored electrification of that company's San José and Port Costa lines, and also to the possibility of operating its mountain divisions by electricity. Mr. Doble concluded with some very interesting remarks on the leading hydro-electric power stations and transmission systems of California. The distinguishing characteristics of each plant were mentioned and special reference was made to the new De Sabla power house of the California Gas & Electric Corporation, where is now operating an 8000 horse-power tangential water wheel, the largest single water wheel on the coast. This station regularly supplies power to San Francisco and other points over 300 miles distant.

At the annual meeting of the stockholders of the Guerber Engineering Company, Bethlehem, Pa., held January 31, the following directors were elected for the ensuing year: William B. Myers, Charles M. Dodson, A. N Cleaver, Joseph W. Adams, F. C. Stout, Robert H. Sayre, Owen F. Leibert, J. A. Eberts and P. A. E. Guerber. The directors elected the following officers: A. N. Cleaver, president; Owen F. Leibert, vice-president; J. E. Boatrite, manager; William B. Myers, treasurer; P. A. E. Guerber, superintendent, and F. H. Brunner, secretary.

A New Baush Boring and Turning Mill.

Several improvements are to be found in the boring and turning mill illustrated herewith, which is the latest design of the Baush Machine Tool Company, Springfield, Mass. The machine is equipped with one turret head and one swivel head and has a capacity for work 44 inches in diameter. The table is 42 inches in diameter, gear driven and has 10 changes of speed, 5 with back gears and 5 without. The maximum speed of the table is 20 revolutions per minute and the minimum speed 6. The teeth of both the table and pinion are of steel, accurately planed. The greatest hight from the table to the cross rail is 37 inches and under the tool holders 31 inches. On the under side of the table there is an outer bearing nearly equal to the diameter of the base.

The table spindle is 10 inches in diameter and about 20½ inches long. It has a straight bearing acting in conjunction with an angular bearing which receives the side strains. A thrust ball bearing on the lower step of the spindle avoids any tendency to lift and excessive friction of the table when a heavy cut is being made. The surface of the table is 2 feet 6 inches from the floor.



A 42-Inch Boring and Turning Mill with One Swivel and One Turret Head, Built by the Baush Machine Tool Company.

The turret slide, shown at the right in the illustration, can be set for boring or turning operations or to cut 8 and 11½ threads per inch and has a vertical movement of 24 inches. The turret has five sides, is 10½ inches across the flats, and each face contains a 2 5-16-inch hole. The heads may be moved independently, either in direction or amount of feed. The left hand head can be set at any angle and has a movement of 24 inches. Either head can be brought to the center for boring, and both heads have a vertical movement of 24 inches. The heads are attached to steel feed screws by split nuts, which can be opened to allow of a rapid movement through a ratchet and pinion engaging a steel rack on the cross rail.

The feeds are positive, and there are 15 changes, ranging from 1-64 to 61-64 inch horizontally and 1-64 to 9-16 inch in angular and vertical directions. The cross rail is raised and lowered by power, and may be so moved without revolving the table. The table may be stopped instantly by applying by hand a band brake, which acts on the main driving cone. The back gears can be changed by the movement of a lever and without the use of a locking nut.

Ordinarily the machine is furnished with a plain table, as illustrated, or it may be supplied with a three or four jaw independent and universal chuck. Another option is the provision of two regular swivel heads in place of one swivel and one turret head. When driven by belt from a line shaft a countershaft is used carrying tight and loose pulleys, the driving pulley on which is 20 inches in diameter. It accommodates a 4½-inch belt, and should run at 300 revolutions per minute. Being self contained, the machine does not require an expensive foundation. It weighs 16,200 pounds and occupies a floor space 8 feet 5 inches by 9 feet.

The calorific values of several different fuels used in internal combustion engines are compared in British thermal units per pound in a paper by **M. L. Levi**, recently published in the *Revue Technique*, as follows:

Methylated alcohol	10.620
Methylated alcohol, mixed with 50 per cent. gasoline	14.200
Crude American oil	19.630
Refined American oil	19.880

The mixture of methylated alcohol and gasoline can, it is stated, be used as easily as ordinary gasoline; but with unmixed alcohol it is necessary to warm up the carburetor a little before starting, as the alcohol does not vaporize readily enough at a temperature below 68 degrees F.

The American Steel Foundries, which has purchased the plant of the Simplex Railway Appliance Company at Chicago, will not remove it to Franklin, Pa., as reported, but it contemplates the establishment of an Eastern branch of the Simplex plant at Franklin, for the manufacture of certain railroad appliances peculiar to the Simplex Company.

Rolls for Uneven Angles.—IV.

BY WILLIAM HIRST.

Draft.

In a series of passes for producing a given section the primary object is the formation of the section and not merely reduction of sectional area. In designing passes we are given the section required; we must know the size and character of the billet from which it is to be made and have a knowledge of the capabilities and power of the train upon which it is to be rolled. It is sometimes required that the bar shall be made from a billet kept in stock. In such cases it may be necessary to give it a few passes to make it conform to the length and thickness of the first shaping pass. Having determined the position of the section as a pass, we may proceed to determine the number of passes which will be required to form the section from the billet. The passes designed for leaders to the finishing passes must be of such size and shape as to conform thereto, so that the transformation of the section from billet to bar may be accomplished before the leader is reached. In the series illustrated in Figs. 16, 17 and 18 the heaviest bars are made in two passes less than the light ones, and whatever number of passes is required to work out the section must be added to the last three of Fig. 17. Three things are to be considered in connection with the ques-

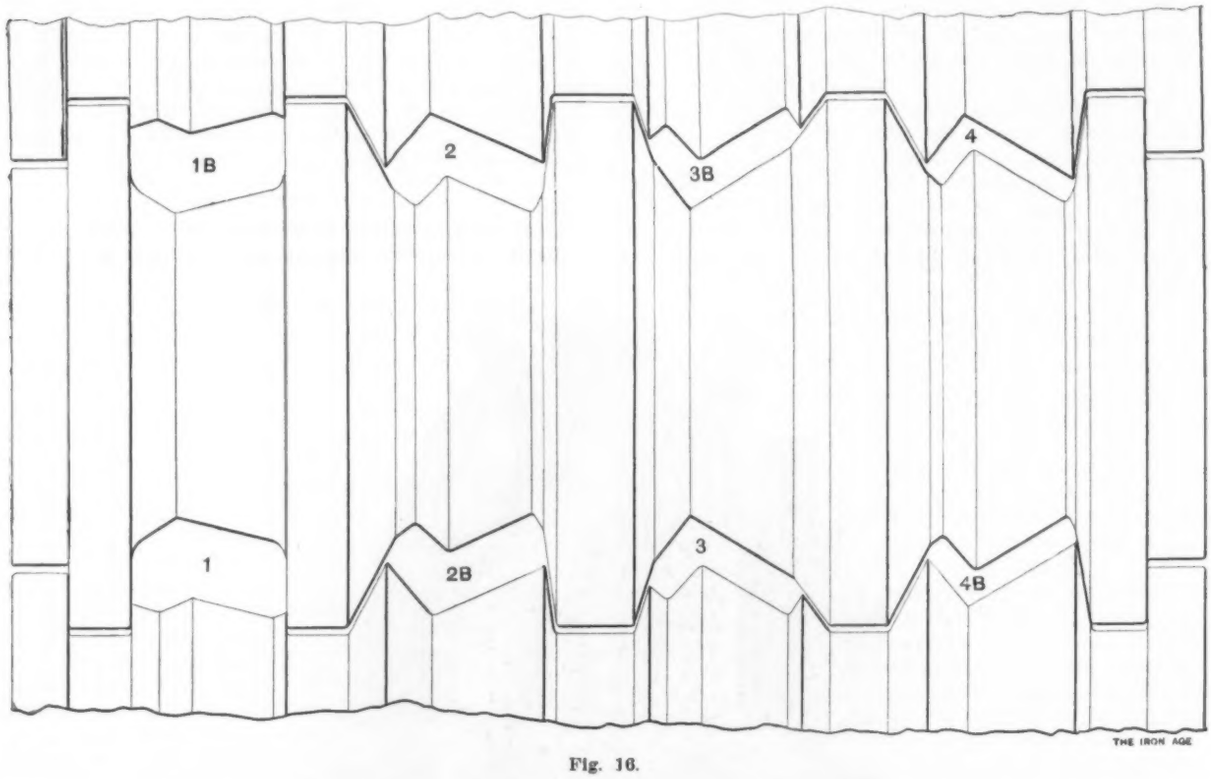


Fig. 16.

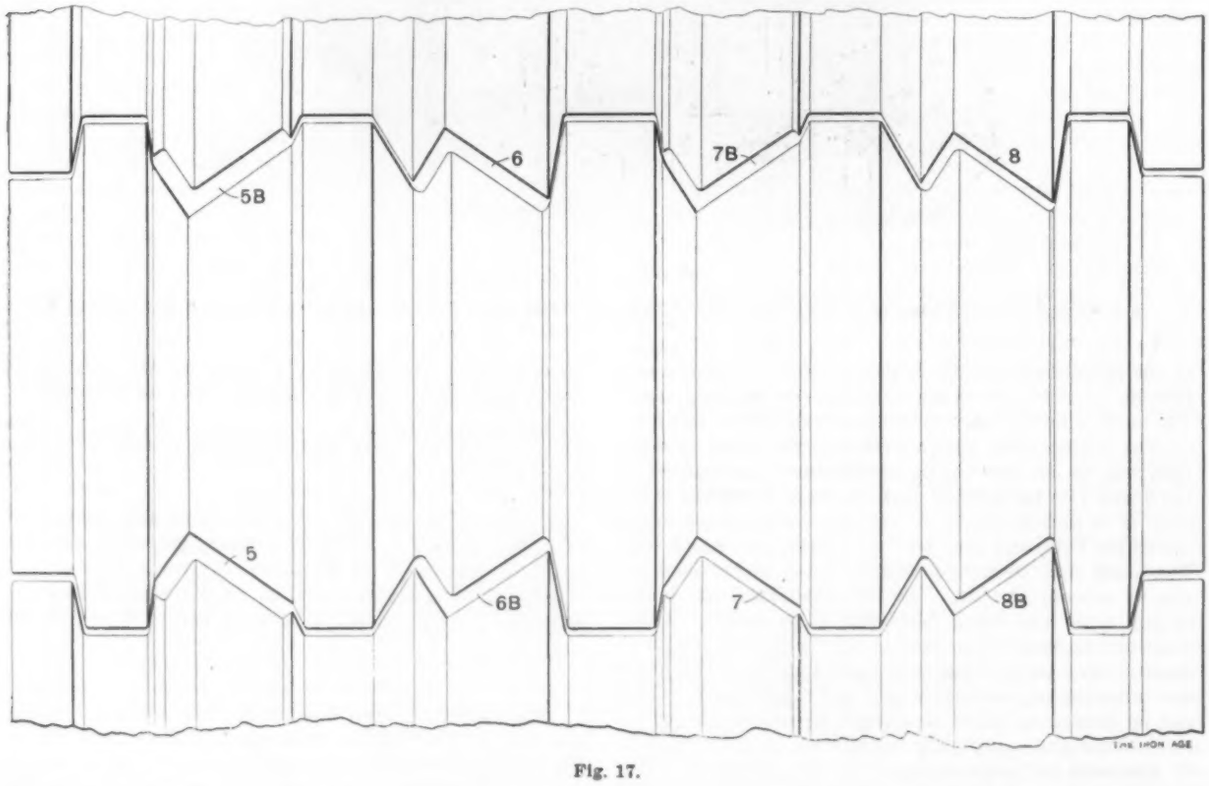


Fig. 17.

tion of draft—namely, the size of the billet as related to the width of the pass, the size and strength of the rolls, and the capacity of the driving element.

In the past, and perhaps at the present time, there are instances of inadequacy in the driving element, so much so that it is not safe to leave it entirely out of the question unless it is known that it will meet all demands made upon it. Lack of power is most evident when rolling long bars or when the bars follow each other in rapid succession. While the bar is short the momentum of the moving parts will carry it through, but where the bars are long and the power is insufficient the drag may be eased by a modified draft by adding one or more extra passes.

As to the strength of the rolls, it is practically useless to attempt to formulate any rule for draft as it relates to their diameters. There are so many interdependent factors in the problem that almost each instance would present its own modifications and exceptions. As a common example the following may be given: A wide surface acted upon offers proportionally greater resistance than a narrow one; the stress on the rolls varies with every degree of hardness and heat in the bar.

As to the rolls themselves, their strength as applied to the reduction of metal is an unknown quantity. Steel

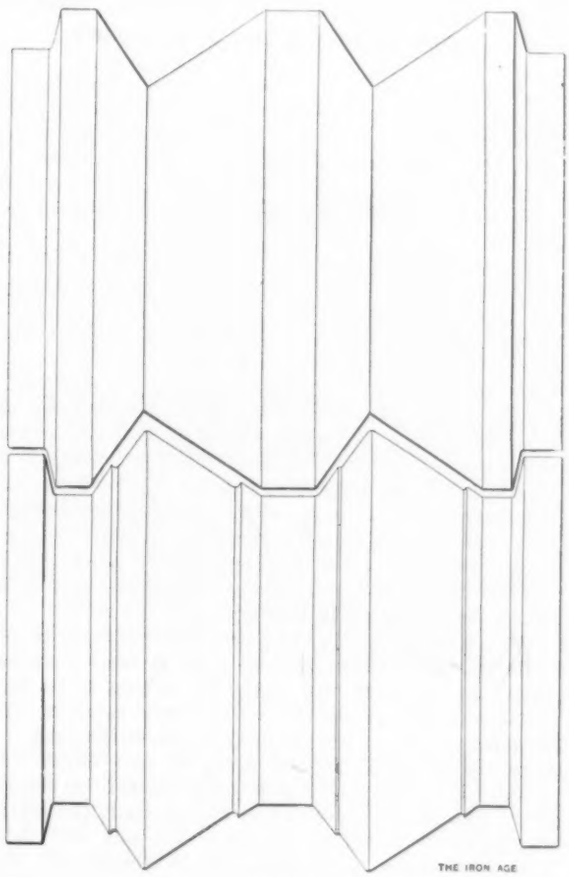


Fig. 18.

rolls have been known to break from strains within themselves, while others have a physical structure so nearly perfect that they seem able to bear any stress that may be put on them in the line of work. It must therefore be evident that there is a variety of imperfections between these extremes. In short, there is nothing constant that is accepted as a guide; the matter must, therefore, be left to the designer's judgment, qualified by his experience and observation. As the grooves in a roll reduce its effective diameter, we may regard these as the source of weakness. At or near the journals the roll may be cut to the diameter of the journals without passing the danger point, but nearer the middle of its length this cannot be done except the metal is soft iron or the draft very light. Generally we may assume that under ordinary working conditions if a roll is not cut to a diameter less than one-fourth its length it is within the reasonable limit of its strength and capable of a draft of 30 per cent. on a bar having a width equal to one eighth of the roll's length. By the roll's length is meant only the body.

Having decided upon a draft of 30 per cent., we form a new pass by adding an amount that would require this rate to reduce it to the leader for the heavy section (pass No. 6, Fig. 17). This increase should be disposed in such a manner as to bring the form of the new pass nearer to the outline of the billet. In forming the individual passes it should be remembered that it takes a whole series to form the bar and that a pass is but one step in the transformation of the billet. That is the common object, and therefore each pass is constructed with the view to bringing the section it receives nearer to that of the one required. The usual method in constructing new passes is to build up from the last in such a way as to gradually approach the section of the billet, but no faster than is warranted by the amount of draft.

Depth of Grooves.

Generally the depth of the grooves should be sufficient to completely inclose the billet or the bar; otherwise the bar at times may be forced over the edge of the collar, which might cause the bar to sliver. It is obvious, too, that this is a source of danger, from the fact that if the bar were fairly caught between the two collars the result might be the breaking of one or both rolls. It may not be necessary to make all the passes as deep as the first two in Fig. 16, but in this series the difference is so little that the side collars may all be made of the same diameter. This is usually done for the sake of convenience when turning the rolls, but in cases where the necessary hight of the collars on the grooved roll would cut into the forming collar or tongue roll so deep as to seriously impair its strength it is advisable not to make them any higher than is absolutely essential.

The sides of the passes project (in these rolls) into the top and bottom, requiring recesses to receive them. These passes are set so as to be about equally divided above and below the pitch line, and as the sides of the pass must be considerably higher than the actual hight of the section, the sides of the passes must run into the recesses deeper than the lowest part of the groove. Any unnecessary hight of collar, therefore, tends to weaken the top and bottom rolls or their equivalent in other sets.

Where the character of the passes makes these recesses necessarily deep the strength of the collar rolls (top and bottom) may be increased by turning them to a relatively larger pitch than the grooved (middle) roll, but such an increase affects the working of the pass by making the average diameters of the working surfaces on the collar roll greater than those in the groove. In addition to having a bad effect on the bar the slip of the larger diameters makes a serious demand on the driving element and largely increases the wear on the rolls and guides.

Type of Rolls.

In a three-high system the top and bottom rolls in a set of this kind are duplicates. Referring to the pass, they may be either grooved rolls or collar rolls. Whenever it is optional whether the middle or the top and bottom shall be collar rolls the question may be decided on the point of greatest practical utility, which is, in the main, the greatest length of service. Aside from the possibility of breaking, the life of a set of rolls is due to their wearing qualities and to what extent, if any, the wear can be taken up.

When the sides of the pass have little or no taper it is obviously impossible to take up wear at that point by reducing the diameters of the rolls. On the other hand, if there is much taper, wear is readily taken up in that manner. In regard to the grooved rolls in Figs. 16 and 17, the wear on this account is not likely to be such as cannot be easily repaired. The collar rolls, however, are least to be depended on to resist wear and the crumbling away of the corners. Ordinarily the collars wear the most in any form of pass, but constructed as these are there is more probability of their breaking at the corners. Taking this into consideration it seems better to make duplicate collar rolls for the top and bottom, so that when they become worn in one position they may be transposed and worked in the other.

It will be noticed that in use there are as many idle passes—those designated by the addition of the letter B to the number—as there are passes in actual use. When those collars in use become much worn or perhaps broken the top and bottom rolls may be transposed and the unused collars brought to work.

Spacing the rolls—that is, placing the grooves with reference to each other—in this type of pass does not call for any great thickness of collar forming the sides. The sides, having considerable taper, do not need any great width at the top so far as strength is concerned. There should, however, be space enough between the limits of the adjacent passes to set side guides in front if necessary. It may be observed that the sides of the passes having the greatest taper come next to each other, as do those having the least. If the passes were all spaced the same distance apart some of the collars would appear to be very wide and some very narrow. For the sake of appearances we may dispose of the passes without strict regard to having them equidistant, unless there is some reason which requires them to be otherwise.

It is advisable whenever practicable to make the ends of the rolls of the same diameter, overlapping the end collar on the middle roll for that purpose. This prevents the larger roll from interfering with the chocks and bearings of its mates, and at the same time provides means for having all the end bearings alike.

The necessity for the endwise adjustment of the rolls required by this form of pass may be objectionable to some rollers, but while it is essential it is very slight and easily made. By accurately tapering the end collars a reliable gauge will be made which, by following it, may only require a single measurement to verify the adjustment. As referred to before, when a section of this kind is set with each leg 45 degrees to the axes of the rolls the decided end thrust has to be anticipated and the rolls must be adjusted to compensate for the yielding of their supports. As the pressure in each pass varies with its draft, it is impossible to meet them all. Therefore the rolls in some passes are bound to crowd over against the short leg more than in others. As there are three rolls in a set, there are three separate adjustments necessary, each of a different degree of firmness and solidity. It needs no argument to show that it is not easy to forestall the various effects of the different strains in the working of the rolls. In very many instances in common practice the failure to apprehend these effects has brought trouble for the roller, too often terminating in one of those disagreeable experiences sententiously expressed in the word "stuck."

(To be continued.)

Central American Notes.

SAN JOSÉ, CENTRAL AMERICA, January 21, 1905.—The American Syndicate which is building the Guatemala Northern Railroad has so far complied with its contract that the line is now open from Puerto Barrios, on the Caribbean Sea, to El Rancho, at the foot of the Central Range of mountains. This gives immediate access to the departments of Zacapa, Izabal, Gualan and Vera Paz, mostly known for their fine crops of coffee, cacao and sugar, as well as mahogany, cedar and ebony forests. It is expected that in six months connection will be made at Zacapa with the Pacific line from San Salvador, thereby opening the way to two republics.

Little is known in a commercial way about Salvador. It is the smallest and one of the richest of all these countries. The density of population is only second to that of Belgium. Its imports cover everything needed in a civilized community, and the exports include cochineal, the rare Peruvian balsam, indigo, gold, silver and copper ores, coffee, cacao and fruit. A good part of the new city of Santa Tecla is built of iron and corrugated sheet iron, this being the best way of fighting the frequent earthquakes. At the capital many of the buildings put up for the Government are made of iron and steel.

The new bridges and extensions on the Santa Ana Railroad will require several thousand tons of railroad material.

In Honduras the Interoceanic Railroad has placed orders with American firms for several passenger coaches and about 50 freight and platform cars. Considerable material for general construction was included in this order, which will be shipped via New York.

Under Engineer Wallace of the Panama Canal work of a thorough nature is being done in and about Empire, as well as surveys along the main line. There have been several deaths from yellow fever, and some of the more recent arrivals have determined to return home.

Colombia is quiet and trying to mend its fortunes under President Reyes, who believes that with peace and plenty of hard work the country will soon be on the road to prosperity again. Colombia certainly possesses vast resources in its forests, mines and soil, the whole interior being in a perfectly virgin condition. Clinging to old Spanish methods and customs, this country has, up to recently, set its face against all progress, with the result that its almost unequaled resources have remained in about the same condition they were 400 years ago. If the Government's intention to parallel the Magdalena River with a railroad to connect the Caribbean Sea with Bogota, the capital, is carried out, much will be heard about Colombia in the near future. C.

The Webster Coal & Coke Company Sues the Pennsylvania Railroad Company.

At Philadelphia, on January 27, in the United States Circuit Court, suit was brought against the Pennsylvania Railroad Company on behalf of the Webster Coal & Coke Company. The basis of the suit is alleged unjust discrimination in freight rates upon coal carried from the mines of the plaintiff over the lines of the railroad company.

This suit is the most notable litigation of the sort that has been entered for some years. It is a fight of giants in the coal and financial world. The Webster Company, which operates mines in Blair, Clearfield and Cambria counties, in Pennsylvania, alleges that the railroad company failed to supply sufficient cars for the delivery of coal from the plaintiff's mines. It is declared that discrimination in this respect was made in favor of rival companies, especially the Berwind-White Coal Mining Company and the Keystone Coal & Coke Company. For this discrimination the plaintiff asks $1,392,695 damages. It is also averred that the Pennsylvania Railroad Company charged the plaintiff 15 cents per ton more for the delivery of coal and coke than was charged rivals, bringing the aggregate up to $1,904,012.24.

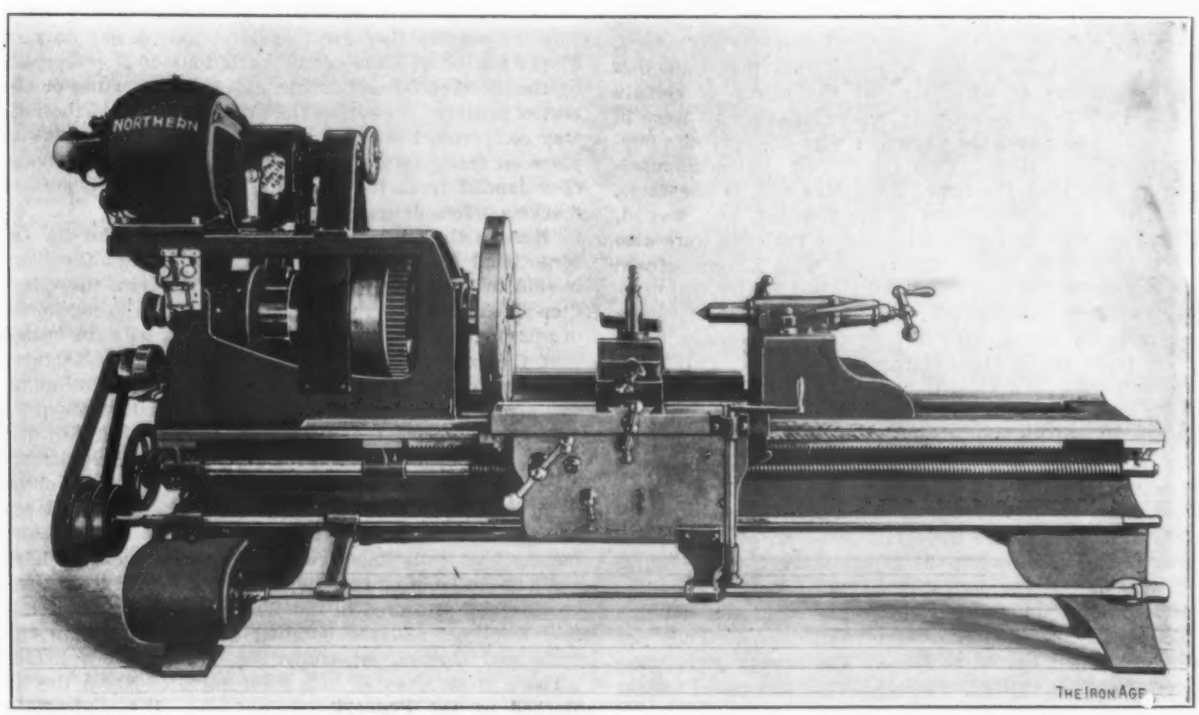
The Webster Coal & Coke Company has recently been absorbed by the Pennsylvania Coal & Coke Company, known as the "soft coal trust," on account of its large holdings in Blair, Cambria and Clearfield counties. The combined capital of the company is $24,000,000, and it is possessed of about 100,000 acres of coal lands. The Webster Company contributed to this pool 55,000 acres of land. The gigantic corporation was partially the scheme of anthracite operators to invade the soft coal field. The chief figure in the company is Thomas H. Watkins of Wilkes-Barre, member of the Anthracite Conciliation Board, and for years an operator of the firm of Simpson & Watkins.

The Berwind-White Company, of which mention is made as being the corporation favored by the Pennsylvania Railroad, has extensive mines and holdings in the Clearfield and Cambria region. Complaint of favoritism being shown this corporation by the Pennsylvania is not new in coal and railroad circles.

Figures compiled by Appraiser Whitehead show an increase in the imports at New York in January compared with those of January, 1904, of about $6,000,000. The greater part of the increase is in articles of luxury. The imports of precious stones and pearls alone show an increase of more than $1,500,000 over the corresponding month of last year, and there were 78 automobiles, valued at $280,000, imported, against 54 machines, valued at $195,000, in January, 1904.

The Northern Multi-Speed Motor for Machine Tool Drive.

The arrangements commonly employed for the variable speed drive of machines and machine tools through individual electric motors may be grouped in three general classes, purely mechanical, purely electrical and a combination of mechanical and electrical. In the mechanical device it is usual to use a constant speed motor and to obtain variable speeds by change gear mechanisms; in the electrical the different speeds are obtained entirely by varying the speed of the motor, and in the third class a variable speed motor and a change gear device are used in combination. Where such combinations are made the result is ordinarily partly the product of the motor builder and partly the product of the machine builder, but in the motor which the Northern Electrical Mfg. Company, Madison, Wis., has recently brought out the mechanical and electrical features are combined in the part furnished by the motor builder. The driving unit comprises a Northern variable speed motor directly connected with a change gear box. The aim has been to produce a motor equipment capable of a large range of speeds and adaptable to existing tools without the expense of obtaining a specially designed change gear mechanism. With this possible, it is comparatively easy to modernize an old machine shop containing many belt driven tools which are too good to discard in favor of new tools originally arranged for high cutting speeds and the use of high speed cutting tools.



A Blaisdell 24-Inch Engine Lathe Equipped with a Northern Multi-Speed Motor.

The accompanying illustration shows a 24-inch Blaisdell engine lathe originally designed for the ordinary cone pulley belt drive and now re-equipped for electric drive, all of the new parts for which were supplied by the builder of the motor. The motor with its change gear box is mounted on a saddle which bolts directly to the head stock and replaces the bearing caps. The drive is by chain connecting a pinion on the motor with a split gear which is clamped around the next to the largest step of the cone pulley. A guard surrounds the chain both above and below the motor bracket to protect the operator from accidental contact with the running parts. Originally the machine had eight spindle speeds through the cone pulley and back gears. With the new arrangement 80 spindle speeds are possible, ranging from 3½ to 330 revolutions per minute.

The motor is supplied from a standard two-wire single voltage circuit, and with its mechanical speed changes gives driving speeds of from 600 to 1370 revolutions per minute with a total variation of 7 to 1. It is possible, however, to supply equipments in which the speed variations obtained through the motor and its change gear are as high as 15 to 1. The gears in the change gear bonnet run in oil, which makes their operation noiseless and reduces wear to a minimum.

The levers controlling the speeds are two in number. One at the right end of the lathe apron operates the motor controller through a splined rod extending along the base of the lathe bed to the motor controller. The second lever is used to manipulate the change gears on the motor, and is so placed as to be convenient of access, although only used when radical speed changes are required. A particular advantage of the gear box used with the motor is that the speeds may be changed while the motor is running, whereas with the ordinary back gear arrangement it is necessary to stop the lathe while making the change.

Multi-speed motors will give a speed variation of 4 to 1 or 5 to 1 where the variation within the motor itself is 2 to 1, while a 3 to 1 motor with the gear box will give a total variation of 9 to 1. A variation as high as this will cover the ordinary needs in machine tool drive where stepped or cone pulleys are now used. With a 4 to 1 motor the possible variations are 12 to 1, and with a 5 to 1 winding the multi-speed motor will afford a variation of 15 to 1.

The total number of speeds obtained depends upon the number of points in the controller. In the case of the lathe which is illustrated the controller has 20 points, and there are therefore 20 speeds through the motor direct without the use of the gears. The gears make 20 more possible and with the lathe back gears a total number of 80 spindle speeds are available. This large number of speeds is of considerable advantage not only in facing work in the lathe, but in turning shafting, as a large range of speeds is available for a given diameter, or a much larger range of diameters may be brought within a uniform cutting speed. The machine can be stopped for examination and measurement of work without stopping the motor and started again by the use of the clutch lever shown on the side of the change gear bonnet. It is worthy of comment that the lathe in its transformed condition has nothing of the unsightly appearance often to be found in a changed over machine, and to all appearances is quite as neat as would have been possible had the tool and motor builders concurred in the production of the result.

Trade Influences in Canada.

Wire Rods and Their Products.

TORONTO, February 4, 1905.—Already the operation of the Dominion Government's new policy toward the iron and steel industries has produced marked effects. These are perceptible both in the activity of home works and home enterprise, on the one hand, and in the returns of the import trade on the other. At Sydney the rod mill of the Dominion Iron & Steel Company maintains the increase in its daily output upon which it ventured some time ago, and the company's rail mill will soon be in readiness to put its product on the market. The rail mill of the Algoma Iron & Steel Company at Sault Ste. Marie is reported to be increasing the considerable business it has had in sight since it opened up in the early autumn. Both developments are the direct result of the protective measures adopted in 1903 and 1904 by the Government. In both classes of product there has been a decided shrinkage—in the case of rails, a practical disappearance—of orders going to foreign mills.

Wire rods, it will be recollected, were favored by a bounty of $6 a ton, established in October, 1903. This bounty was to apply only to rods sold in Canada for manufacture into wire here. When exported the bounty was not payable. In time that restriction was abandoned. This was owing to the representation that Canadian manufacturers of wire were at the mercy of certain United States manufacturers, whose sales agents were in a position to coerce the Canadian wire drawers into buying rods from them. That the United States manufacturers had thus the upper hand was due to the facts, first, that wire rods were on the free list, and, second, that barb wire and some other staple varieties were also on the free list. Hence, if Canadian wire makers refused to buy their material from the United States manufacturers referred to the latter could demoralize the former's business by selling wire directly to the wholesale hardware trade and to other distributers of wire. This being the situation, the Canadian wire makers deemed it to their advantage to continue sending their orders for rods to the United States. Thus, at the outset the $6 bounty did not do the Dominion Iron & Steel Company much good. Though it was thereby enabled to offer rods at a low price, its United States competitors were also able to cut prices. There appeared to be no outlet for the new Canadian rods but the export market, and recourse to that meant the forfeiting of the bounty. Then the antidumping clause was added to the Tariff act, and that has greatly relieved the rod manufacturers. They can now sell their output at home. The bounty gives them leeway for the cutting of prices if they find resort to that course advisable, while the penalty duty against dumping requires the United States manufacturers not to quote lower prices here than such as are on a parity with what they are getting regularly at home. It is true the antidumping clause is restricted in its operation to goods that are on the dutiable list. Wire rods, being on the free list, would be exempt from its action but for the fact that they are specifically named in the law as an exception to which that special duty must apply. It is provided, however, that in their case the antidumping duty is not to exceed 15 per cent. ad valorem.

The United States manufacturers cannot blame the Canadian wire manufacturers for transferring much of their business to the Sydney mill, for the disposition of the trade is no longer a matter of favor on the part of the buyers, but largely of Government policy. Of course the United States manufacturers can retaliate still by selling wire to Canadian hardware wholesalers and other large traders in that manufactured product. And United States wire is coming, particularly such wire as is on the free list bill, and the home manufacturers are finding trade good. Especially is their hold more secure on the nail trade, because nails are dutiable and the antidumping clause prevents cutting. Of barb wire, which is on the free list, the quantity entered for consumption in the five months ending with November is 146,277 hundredweight, of which 139,632 hundredweight came from the United States. Galvanized wire, which is also free, continues to figure as usual in the imports, and of the 88,061 hundredweight received in the five months mentioned the United States furnished 76,528 hundredweight. On the dutiable varieties the home trade is steadily getting a larger part of the market, for in these it has the penalty duties supplementing the regular duties.

That the American Steel & Wire Company or its selling agency is not making war on the Canadian wire makers by selling direct to wholesalers is no doubt in some measure the result of a modification of the understanding of which the selling agency was formerly the dictator. There seems to be a partition arrangement by which the Eastern trade shall be allowed to fall within the sphere of the Dominion Iron & Steel Company. That sphere has extended to Montreal, where the Montreal Rolling Mills Company is using Sydney rods from which to manufacture its large output of wire.

Steel Rails.

We are now completely clear of the period within which exemption from the rail duty was possible. To escape the duty after it was proclaimed, rails had to be imported not later than November 1, and must be laid by February 1. The latter date is now past, and there can be no controversy henceforth as to the liability for duty of rails either in warehouse or on track. If they come into the country they are ratable at the regular duty of $7 per ton or at some of the variations of it prescribed by the preferential section, the antidumping clause or the surtax proviso. To outrun the tariff, so to speak, the railway companies have been making energetic endeavors to place on track as much as possible of the large tonnage they landed from the United States and other outside markets before January 1.

Besides the Dominion Government's order for the International Railway, the Algoma Iron & Steel Company is said to have received a large contract from the Canadian Pacific Railway, which has an extensive programme of relaying and new work for the year. It was announced that the contract called for 25,000 tons. Those figures are now reported to be an understatement of the quantity involved. So far, the Grand Trunk Pacific Company's wants are apparently still all to be provided for, the cabled story of negotiations for buying on the British market having been denied by one of the chief officials of the company. It is an interesting question whether the clause of the Grand Trunk Pacific act relating to duties really insures that rails imported for the Government division shall be dutiable or not. The railroad construction proceeding and projected in the West should keep the Sault mill employed and the building that is planned in Ontario and Quebec, especially the Grand Trunk Pacific division from Moncton to a point north of North Bay in Ontario, should benefit the Sydney mill. It is understood that the price at which Sault rails are being offered is slightly inside that at which British rails can be laid down, the base duty on them being $4.66 2-3 per 2000 pounds.

In this connection account is to be taken of the fact that the Ontario Government has an important influence that it may exercise for the advantage of Canadian rail makers. The province has been exceedingly liberal in voting subsidies to railways. These vary from $3200 to $6400 per mile. By an act passed some years ago the Legislature provided that, instead of paying these or any subsequently voted grants in cash, the Provincial Government might deliver their equivalent in steel rails. There are conditions attached, however. If the subsidy vote in any case does not contain mention of this alternative, then the Government can compel the railroad company to take half the equivalent in rails. In the second place the rails must be of acceptable quality, they must be of Ontario make, and two-thirds of the ore in their composition must be the product of Ontario mines. Now that Ontario has a rail mill, there is a possibility of this law being amended so as to favor the latter in a still larger measure. The requirement of so large a percentage of domestic ore may be modified.

Change of Government.

This reference to the part the Ontario Government might play in widening the home demand for home made

rails brings into the question the important fact that there has just been a transfer of the balance of power in the province. For 33 years the Liberal party has ruled Ontario. In the general elections of the 25th ult. that party was overwhelmingly defeated, only 28 of the 98 seats being won by Premier Ross and his candidates. Thus Mr. Whitney, the leader of the Opposition, is swept into power by a House majority of 40. There are many queries as to what his course will be toward the industries at Sault Ste. Marie. Their political influence has been steadily exerted against him, as they were assisted in various ways by the Ross Government. It is improbable that the new Premier will be unfriendly to the enterprises. He could, of course, make conditions very different. He might insist on the rigorous fulfilment of the conditions on which the land, timber and mineral grants to a number of the constituent concerns of the Lake Superior Corporation had been given. He might apply to the Helen ore a manufacturing clause like that inserted in the Timber act requiring Crown pine to be manufactured into products in Canada only. In various ways he might show lack of sympathy so as make things less comfortable for the companies. There is no reason to believe, however, that he will be unkindly. He has given strong assurances that he will promote the interests of New Ontario, and at least so far as is consistent with that general object can be depended on to further the welfare of the Sault industries. That he is capable of harboring vindictiveness for the past political antagonisms of the companies no one who knows him will for a moment believe. C. A. C. J.

Important Customs Decisions.

A decision of much importance to all classes of importers was handed down by the United States Circuit Court of Appeals February 2 in what is known as the "ten-day bond" case. Its effect, customs officials say, is to nullify the object of the Treasury regulation requiring importers to give a bond when they receive imported merchandise before examination. It is the custom now for the collector to order one package in ten of each importation to the appraisers' stores for examination. The other nine packages are delivered to the importer on his executing a bond as a guarantee that he will not open the packages for ten days, unless previously released by the collector, and that if called upon within that time he will return them to the custody of the collector. In practice this agreement is seldom lived up to. If the goods are sold "to arrive," the importer ships them to the purchaser direct from the dock, and by the time the examination of the sample packages is completed the larger portion of the importation has gone into consumption. If they are not sold such portions of them as are needed are opened immediately and put into stock.

In the case just decided by the Court of Appeals, the collector called on an importing firm to return a package which had gone into consumption. On failure to do this he sued for the forfeiture of the firm's bond, which in this case was for $50,000 for six months, to cover its running importations during that time. The counsel for the first tried, ruled that the Government could recover on such bonds unless it could prove that it had sustained actual damage through the failure of the importer to return the package called for, and that then it could only recover an amount equal to the damage which it could actually prove. The Circuit Court, in which the case was first tried, ruled that the Government could recover twice the value of the package demanded on the mere proof of the importer's failure to return it on demand. In the Circuit Court of Appeals February 2 Judges Lacombe and Holt in a majority opinion sustained the counsel's contention, and Judge Wallace joined with them in reversing the lower court, but wrote a dissenting opinion holding that the Government could recover the actual value of the package on the proof of the importer's failure to return it.

Customs officials say that if the decision of the Court of Appeals is affirmed by the Supreme Court the bonding regulation may as well be dropped. They declare that it would be practically impossible for the Government to prove that it had suffered damage in the absence of an opportunity to examine the package. On the other hand, the fact is pointed out that in the silk fraud case it was proved that the Government had suffered loss three years after the goods had gone into consumption.

As the result of a conference held February 3 in the office of United States District Attorney Burnett, New York, arrangements were made by which it is expected that the delay which has characterized the trial of customs suits in the United States Circuit Court and the Court of Appeals will be ended. These delays have almost attained the proportions of a scandal. Appeals to the Circuit Court from the Board of General Appraisers have frequently lain two or three years before they were reached by the Court, and there are cases on the calendar now which were started 13 years ago, and that involve the rate of duty under long dead tariff laws. In addition to District Attorney Burnett and members of his staff, General Appraisers Fischer and De Vries, Assistant Attorney-General McReynolds, Judge Lacombe of the United States Circuit Court and Frank W. Lawrence, law clerk to the Board of General Appraisers, were present at the conference. It was found on discussion that the chief cause of delay was the lack of any means to compel attorneys to put their cases on the calendar promptly after appeals have been taken. As a result of the conference, Judge Lacombe promised that the judges of the Federal Courts in this circuit would adopt a set of rules to remedy this defect. These rules will be as follows: Papers must be served on the collector within three days after the filing of the petition in an appeal from the Board of General Appraisers. An affidavit of service must be filed with the Court within two days thereafter, and the judges will immediately make an order on the Board of General Appraisers that the record in the case be sent down to the Court. This will have the effect of putting the case on the calendar, and will place the responsibility for delay on the judges and the district-attorney. Judge Lacombe promised that the judges would do their part by refusing to allow postponements to attorneys for the importers, unless they could show good cause for delay. He also promised to ask for a special session of the Circuit Court in April to clear off the accumulation of cases now before it.

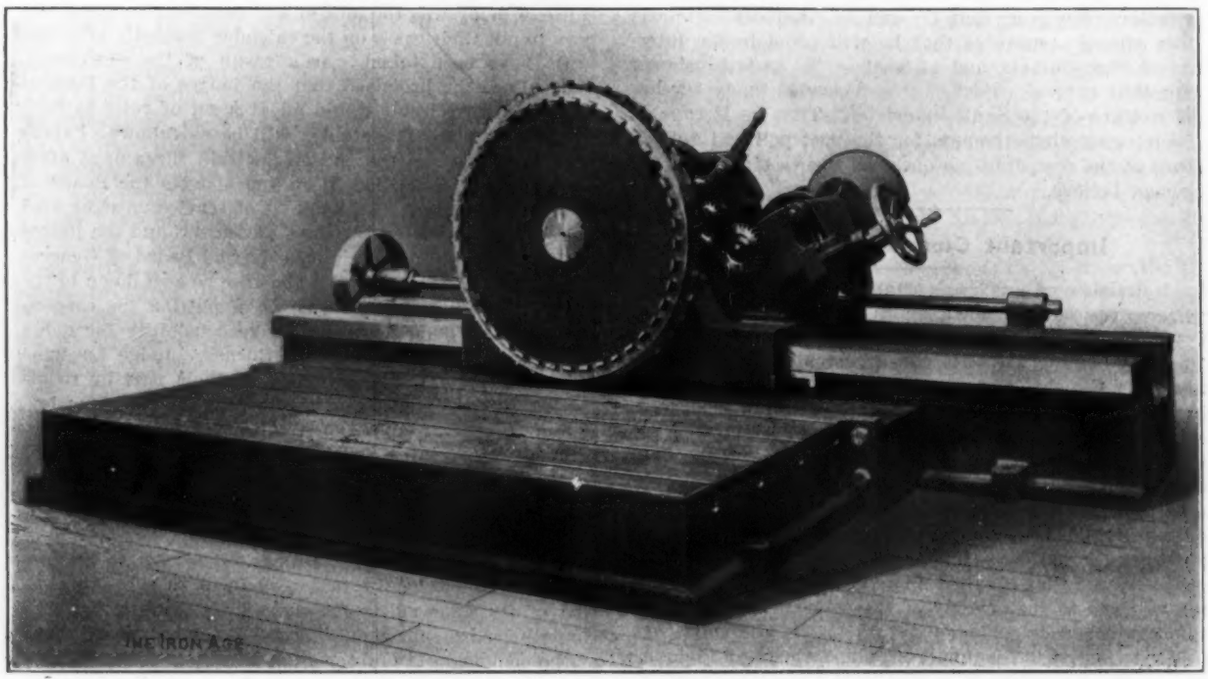
Allis-Chalmers Sales Offices.—The Allis-Chalmers Company is making important changes in the organization of its sales offices throughout the country. These changes are brought about because of the broadened scope of the company's operations since it acquired the Bullock Electric & Mfg. Company. Hereafter each district sales office will represent all the company's lines of manufacture in prime movers, as well as in saw mill, flour mill, mining, crushing, cement and other machinery and the electrical interests. At St. Louis a district sales office has been opened in the Chemical Building. H. P. Hill, formerly district manager for the Bullock Company, is the manager for the consolidated offices. At Cleveland a district sales office has been established in the New England Building under the management of Franklin Wharton, formerly district manager for the Bullock Company. At Pittsburgh a sales office is located in the Frick Building, under the management of H. Wiedeman Murray, who has for years represented the company in that district. At Kansas City, Mo., a new office has been established in the Dwight Building, with George W. Mattison in charge. At Buffalo, N. Y., a district office, with temporary offices in the Ellicott Square Building, has been opened under the management of George W. Pulver, for a number of years with the Westinghouse Electric & Mfg. Company at its Syracuse office, and acting manager of that office until recently.

Seymour R. Church, San Francisco, advises us that while the Seymour R. Church Company has ceased doing business it has not been succeeded by Schmidt & Faure, as stated in our issue of January 19. Mr. Church is still in business at the offices occupied by him for years, at 307 Sansome street, San Francisco, and Schmidt & Faure are located at 220 Market street.

The New Newton Rotary Planing Machine.

Several new features are to be found in the rotary planing machine illustrated herewith, a recent redesign of the Newton Machine Tool Works, Philadelphia, Pa. The cutter head is 42 inches in diameter over the tools and has an in and out adjustment of 3 inches. It is driven by an internal pinion and gearing through phosphor bronze worm wheels and hardened steel worms of steep lead. The illustration shows a belt driven machine, but it is also made for motor drive, in which case the motor is mounted on top of the carriage immediately back of the cutter head. The feed motion is taken from the internal gear by a pinion and operates through tumbler gears, which are controlled by the lever shown at the right hand side of the figure. This gives four changes of feed through positive gearing to the saddle by means of a spiral pinion and rack of 8 feet and power quick traverse in either direction.

With this design and method of operation the machine is practically self contained. There are no overhanging parts or long shafts and screws which usually are a source of annoyance, owing to the sagging and binding so apt to occur in a shaft 15 feet long. In the machine illustrated the work table is 9 feet long and 4 feet wide. It is a standard design of the company when arranged as illustrated or when in portable form or on a circular subbase.



The New Newton Rotary Planing Machine.

The new cruiser Milwaukee, now nearing completion at the Union Iron Works, San Francisco, when she starts on her official trial trip next summer will undergo a novel test. In addition to the usual tests of speed, turning, stopping, backing and performing other evolutions, the Milwaukee will be observed for the amount of smoke she emits from her stacks. According to the plans at present suggested, a series of photographs of the cruiser will be taken while she is under way, and from these, taken at fixed intervals of time, the amount of smoke may be determined with fair accuracy. Excessive smoking will be remedied as far as possible, and data may be obtained from which to avoid or lessen the smoke in future war ship construction. It is further desired to measure the smoke emission on account of its being a valuable index of the efficiency of boilers and furnaces, excessive smoke indicating indifferent fuel or imperfect combustion of the fuel.

Sir James Kitson's American Impressions.

LONDON, January 28, 1905.—Sir James Kitson, M. P., past president of the Iron and Steel Institute, has been giving the Leeds engineers his impressions of America arising out of his recent visit. It is 14 years since he was last in America, and his comparisons are drawn from that date.

What struck him most there was not the invention of new processes, but the development of old ones. American engineers were very acute in accepting the ideas of others and improving upon them, and, with one exception, he thought he was right in saying that all the original ideas had come from the Old World and had been developed in the New. He had been very much struck with the use they made of the system of moving materials by belt or line rollers in the steel mills, &c., and he thought engineers in this country should direct greater attention to this point. By that process the whole of the processes were facilitated. When they saw rolling mills in America producing 5000 and 6000 tons a week it was clear that it was only by these methods they could deal with these vast masses of material and meet the demands of the great market they had. He granted that the American market was a continent which was taking the same kind of thing.

"We here in this country," he added, "work under entirely different conditions, and I think there is no reason to say that the Americans are doing so very much better than we are because they are supplying their great market with masses of material. All our conditions are different, our products are different, and in the main I unhesitatingly say our products are vastly superior to those which are considered sufficient for the requirements of the American continent. But we might endeavor to imitate the Americans in those things which so much facilitate their own manufactures and their own productions." He visited the works of the Jones & Laughlin Steel Company, where steel was being produced by the Talbot process. Mr. Talbot, he believed, was now settled at Leeds and lived at Harrogate. "There," he continued, "you have an instance of an English invention which has received an immense development in the United States. A 200-ton furnace was giving a weekly average output of 1200 tons of steel, and the highest weekly output had been 1675 tons. One of the partners of that establishment informed me that it

was building four more furnaces so as to produce from 250,000 to 300,000 tons a year by the Talbot process. Let me claim some credit for the British invention and give some due meed of praise to the American system of development."

The furnace alluded to gave 5 per cent. more steel than was actually charged in metal, and an additional 5 per cent. came from the oxides from the scale, &c., liberally supplied from the rolling mills. He himself saw the furnace at work. He saw a charge cast, a most beautiful operation, which had the great advantage over us that the steel was there melted by natural gas. Natural gas was of course a very beautiful fuel for steel melting, but it was a gradually diminishing quantity. Whereas, for instance, 14 years ago the Americans were firing all the boilers with it and using it in a very profuse manner, they had now begun to fire their boilers with coal, and were reserving gas for the more special processes of steel melting, welding and the like. And so some of their advantages were passing from them, while our own fuel and opportunities remained with us. Everywhere one went the Bessemer, the Siemens and now the Talbot processes were being used—all the inventions of this land, which were receiving their greatest development in the United States.

"One very interesting and new method," he proceeded, "was introduced to us by Mr. Gayley, who gave us a paper on his new method of freezing air. That method is really a most remarkable improvement and development in the operation of blast furnaces. For several months they have been working a furnace near Pittsburgh with frozen air. As you know, there is more moisture in the air in summer than in winter, and if you freeze the air you reduce the moisture. The result of that has been that the production of the furnace has been increased from 2516 tons per week to 3129 tons, an increase of 613 tons per week simply by the use of frozen air, with the same furnace and the same plant. And the saving in coke has been enormous—from 2147 tons per week to 1726 tons, a difference of 421 tons, or nearly 4 hundredweight to the ton. Reckoning coke at 1 shilling per hundredweight, you will easily see what the saving amounts to. Foremen engineers ought to acquaint themselves with these various processes in order that we might retain our position as a manufacturing nation in competition with the world."

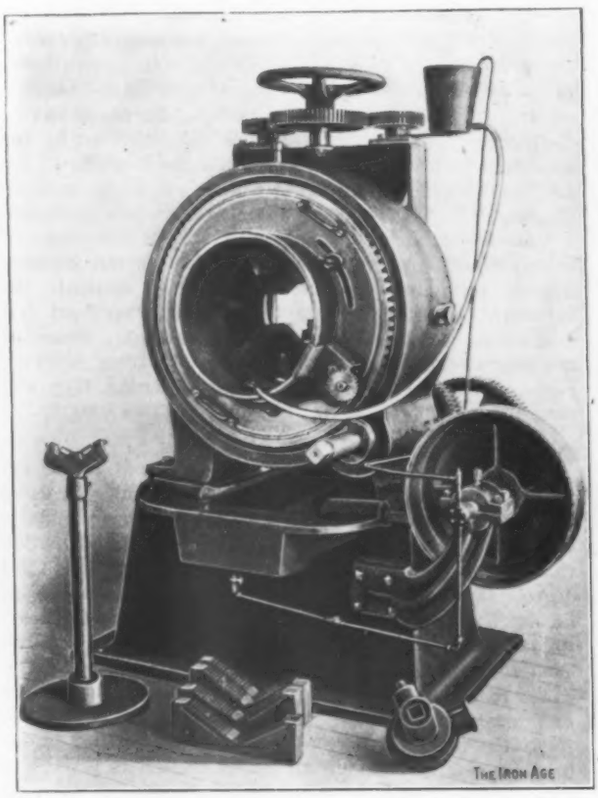
This was not a fiscal question, Sir James further said; but would it be right to deprive this nation by some fiscal device of the inducement to make these economies rather than boldly and manfully to adopt works and lay out plant, and so hold our own in a fair race and fair competition with other nations? The conclusion he would draw was that there never was a time when societies such as the one he was addressing required more to be on the alert and when they more required the habit of association to gather and to communicate information. The Americans had communicated freely and openly all their information, because they hoped to get twice as much in return. So he hoped the members of this society would communicate information to each other in the same spirit. S. G. H.

The Lebanon Valley Iron Company.—The annual meeting of the Lebanon Valley Iron Company was held at Lebanon, Pa., January 23, and resulted in the election of these directors: H. H. Light, S. P. Light, W. S. Davis, S. L. Light, George D. Horst, W. W. Light, Eli Attwood and J. W. Light. H. H. Light was elected president, W. S. Davis secretary and S. P. Light treasurer. The company manufactures merchant bar iron and muck bars, and is adding to its combination train a 16-inch finishing set, which will enable it to make up to 6 inches in flats, 3½ inches in rounds and 3 inches in squares. In addition to this train it is adding a new furnace, which will increase the output from 25 to 30 tons each 24 hours.

At a meeting of the Mining and Metallurgical Section of the Franklin Institute, Philadelphia, held February 2, the following officers were elected: President, G. H. Clamer; vice-presidents, A. E. Outerbridge, Jr., and James Christie; secretary, George P. Scholl.

A Curtis & Curtis Pipe Cutting and Threading Machine.

The pipe cutting and threading machine shown in the accompanying illustration is believed to be the largest machine of its type ever put on the market. Machines are built to handle heavier pipe than 15 inches outside diameter, the extreme capacity of this machine, but they are of the lathe type, the pipe revolving and the cutting tools remaining stationary. This machine, manufactured by the Curtis & Curtis Company, Bridgeport, Conn., has the feature that the head may be detached from the base and taken to the work if necessary and used as a hand machine, one man easily threading and cutting off pipe 15 inches in outside diameter. Often the greater part of the expense in threading pipe is the delay and inconvenience of having to remove the pipe from its position and transport it to a power machine. With this machine heavy pipe may be worked, even when in the



Pipe Cutting and Threading Machine, 15-Inch Capacity, Built by the Curtis & Curtis Company, Bridgeport, Conn.

ground or at the bottom of a trench with only one end exposed.

The machine consists of a die-carrying gear supported and surrounded by a cast iron shell, with an actuating pinion imbedded in the side, together with a self centering vise attached to the back of the shell. The vise is operated by two screws instead of the usual single jaw screw, the two being actuated simultaneously by a gear at the top connected to a hand wheel. On the gear at the back is a lead screw which engages with lead blocks, and thus the feed of the gear is made positive. The dies open and are adjustable. They draw back when the thread is cut by means of a cam motion. The holding bolts at the front of the large die-carrying gear are loosened and the operator grasps the two handles, also at the front of the gear, turning it the limit permitted by the holding bolts, this motion operating the cams and withdrawing the dies, thus avoiding running back over the thread. This motion also makes the dies adjustable so that they will cut either over or under standard size, to allow of any variation in the fittings.

The machine is provided with an automatic cut off mechanism consisting of a star feed, actuating a worm and worm gear engaging a rack cutter. This leaves the pipe square and without a burr. The dies are so cut that

they may be ground upon an ordinary grindstone and are interchangeable, so that if one is broken a new die may be substituted and used with the remainder of the set without supplying an entirely new set. An oil pump and tank feed oil in a steady stream on the work, and provision is made for its return to the tank for repeated use.

Four speeds are possible forward and back. When desired the machine is furnished with direct connected steam engine or electric motor. The capacity of the machine is all sizes of standard pipe from 4 to 14 inches inside diameter and 15 inches outside diameter. It occupies a floor space of 3 x 4 feet.

The Gayley Dry Air Blast.

Some Foreign Opinions.

The publication of James Gayley's paper, read before the autumn meeting of the Iron and Steel Institute, descriptive of his dry air blast process, has naturally evoked lively interest in Europe. In general, the figures given in the paper are accepted as correct, or at least *bona fide*, sundry of the visitors at the Isabella Furnaces having testified to the fact that they are substantiated by the records, which were freely shown on the occasion of the Institute's visit. The question which principally occupies the thoughts of those whose opinions have been published to date is the interesting one as to what is the reason of the extraordinary results obtained, for, as the inventor himself intimates, the fuel necessary to dissipate the moisture contained in the blast would represent but a fraction of the actual saving claimed. Some of the theories advanced to account for the facts are here reported, as, whether they are right or wrong, they will doubtless be of interest to furnacemen in this country.

A German Theory.

W. Schmidhammer, writing in *Stahl und Eisen*, expresses his opinion that the surprising results of using dry air can only be explained by the higher pyrometric effect obtained at the tuyeres. He finds by calculation that the temperature of combustion with dry air is 2294 degrees C., as against 2465 degrees C. when the moisture amounts to 5.66 grains per cubic foot, in both cases leaving the initial temperature of fuel and air out of account. This shows a gain of 171 degrees C. (308 degrees F.), which results in the zone of highest possible temperature (limited by dissociation) becoming greater. This necessarily has a favorable effect, as irregular working is due to the necessity of using an excess of fuel to produce a given grade of iron, so that anything conducive to regularity tends toward lower coke consumption, which, in turn, causes a more favorable composition and lower temperature of the gas.

An English Opinion.

A writer in the *Engineer* of London thinks that the favorable result is caused entirely by the increased density of the air due to its decreased temperature, which increase amounts to 12 per cent. The fuel saved by removing the moisture precipitated in the cooling chamber would account for little more than 1 per cent. of the reported saving in fuel. He is further of the opinion that the increased production is due to the fact that the furnace was previously working with insufficient blast, and that in consequence the normal output could not be obtained, even by fast running of the engines. The writer seemingly ignores the fact stated in the original paper that the speed of the three engines was reduced from 118 to 96 revolutions per minute.

A French Explanation.

The well-known metallurgist, Le Chatelier, writing in the *Revue de Métallurgie*, attributes the extraordinary results, at least in part, to the extra care devoted to the furnace by officials and men. He points out that after the drying process there was left in the air 1.75 grains moisture per cubic foot, while the average moisture in the four winter months in America is only 2.20 grains; but that, although furnaces are known to give slightly better results in winter than in summer, such a saving of coke as Mr. Gayley reports has hitherto been unheard of. According to Le Chatelier, the only advantage of the process is the possibility of obtaining a metal lower in sulphur, which he explains as follows: With dry air, sulphur in the coke arriving before the tuyeres is converted into sulphurous acid, which is taken up by the lime, or, if carbon monoxide is present, calcium sulphide is formed, which also enters into the slag. If the blast contains moisture, however, hydrogen and steam are also present, and, in consequence, the absorption of sulphur is incomplete, sulphureted hydrogen is formed, which unites with the spongy iron higher up. According to this theory, the advantage of the new process is due to the fact that a given limit for sulphur can be kept with a colder furnace.

Discussion by the German Eisenhuettenleute.

At the December meeting of the Verein Deutscher Eisenhuettenleute, at the conclusion of Dr. von Linde's address on the new process, several of those present expressed opinions. The first was Dr. Weiskopf of Hanover, who visited the Isabella Furnaces in November with the members of the Iron and Steel Institute, and who began by testifying to the openness with which the furnace records were submitted to inspection on that occasion. He admitted that the constant watchfulness of an official of Mr. Gayley's standing would tend to better results without any addition to the plant, but denied that it could increase the production 24 per cent. and simultaneously reduce the coke consumption 20 per cent., as the records show. He stated that the foreign visitors were astounded at the results obtained and attempted to explain the true reasons for the same. The heat required to dissociate the small amount of moisture removed can certainly not account for the change, but avoidance of great variation in the moisture seems to be the key to the problem. It is most likely that the passage of steam over incandescent carbon and iron disturbs the equilibrium of the chemical reactions. These reactions, which take place between the mixture of gases $CO + CO_2$, and the solid bodies, iron, manganese, silicon, sulphur, &c., undergo a change on the introduction of steam, and there occur what may be termed reversible reactions, as shown below:

$$\text{I} \quad C + H_2O \rightleftarrows CO + H_2$$

$$\text{II.} \quad 3Fe + 4\,H_2O \rightleftarrows Fe_3O_4 + 4H_2$$

The reactions indicated by the arrows pointing to the right, which must take place under the conditions, absorb heat, and as recombustion of CO in the first and H in the second case is impossible their heating value is lost, as it escapes in the gas, and additional heat is also required to again reduce the metallic oxides. Equation I would explain Mr. Gayley's assertion that there is more CO in the gas when using natural than when using dry air. Changes in the percentage of hydrogen in the gas have not yet been investigated, but to find out to what extent the reactions indicated really take place will be the object of experiments to be undertaken in the near future. It looks at present as though the results obtained must be ascribed to increased regularity in operation and the avoidance of factors that would disturb the chemical equilibrium or cause reactions which absorb heat. Regarding cost, Dr. Weiskopf stated that he was informed that the Isabella installation cost $125,000.

In order to bring out more clearly the different working of the furnace when the air is dry, the figures given in Table V of Mr. Gayley's paper (page 15, *The Iron Age*, October 27, 1904) have been plotted as shown in Figs. 1 and 2. It will be seen in Fig. 1 that with moist air the lines representing production and coke consumption are relatively very irregular, whereas with dry air, Fig. 2, they rise and fall together, which indicates that the furnace is better able to accommodate itself to changes in production and fuel consumption by reason of its freedom from internal disturbance. It may also be seen from the table that the use of dried air does not preclude great variations in the daily output.

Mr. Gayley's Figures Criticised by Dr. Luermann.

The next speaker was Dr. Luermann, the well-known consulting engineer of Berlin, who seemed very skeptical of some of the claims made for the new process. Regard-

ing the decreased work of the blowing engines, he points out sundry apparent discrepancies in Mr. Gayley's paper. The diameter of the blowing tub is given as 84 inches and the stroke as 60 inches, so that, neglecting the piston rod, the displacement would be almost 385 cubic feet per revolution. In another place it is stated that at 114 revolutions per minute the engines were supplying 40,000 cubic feet of air, which would be equivalent to 351 cubic feet per revolution, or 34 cubic feet less than the amount found by the above calculation. Immediately below it is stated that with dry air the engines ran at 96 revolutions per minute, or 18 revolutions slower than before, and that thereby the column of blast was reduced over 6000 cubic feet. This would show $\frac{6000}{18} = 333$ cubic feet per revolution. Thus there are three different values given for the volume of air per revolution. If the engines ran the whole day, or 1440 minutes, without stopping, there would be $6000 \times 1440 = 8{,}640{,}000$ cubic feet less air required. This figure cannot be right if the figures for production

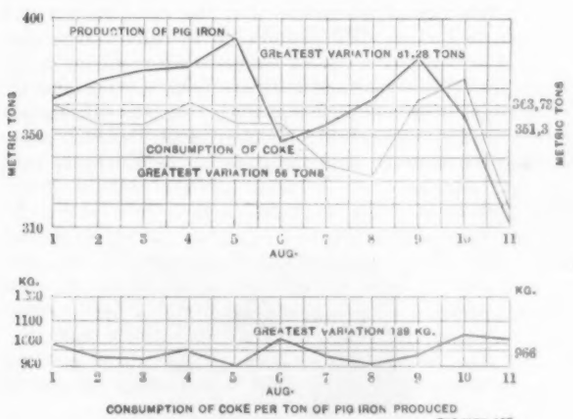


Fig. 1.—With Air Under Ordinary Conditions.

and coke consumption in the two periods when moist and dry blast were used, as given in Table V, are correct, as is shown by the following calculation: In the period without dry blast the average production was 358 tons with a coke consumption of 2147 pounds per ton. The coke consumption for one day would therefore be 768,626 pounds; of this amount there would be required for the dissociation of water in the furnace $358 \times 77.16 = 27{,}623$ pounds. The remainder, $768{,}626 - 27{,}623 = 741{,}003$ pounds, would be gasified by the residue of moisture and the oxygen of the air. In the second period during which dried air was used there were gasified $447 \times 1726 = 771{,}522$ pounds of coke by means of the oxygen in the air and the residue of moisture, which was the same in both periods. The blowing engines must, in the latter case, deliver more, not less, in the proportion 741,003: 771,522. As the supply of air in 24 hours previously amounted to $1440 \times 40{,}000 = 5{,}760{,}000$ cubic feet, the increase would amount to 2,372,317 cubic feet. The difference between the saving in blast claimed by Mr. Gayley, $6000 \times 1440 = 8{,}640{,}000$, and the increase really required, as calculated above, amounts to 11,012,317 cubic feet, which corresponds to $\frac{11{,}012{,}317}{40{,}000} = 275$ minutes, or 4½ hours' work of the engines.*

Another method of calculation leads to similar impossibilities. Mr. Gayley claims to have removed 69 pounds of water per ton of iron using air which originally contained 5.66 grains moisture per cubic foot, of which 3.91 grains had been taken out. According to this, the engines only had to supply $\frac{69 \times 7000}{3.91} = 123{,}529$ cubic feet of air per ton of iron, or $\frac{123{,}529}{2147} = 57.5$ cubic feet per pound of coke. In Germany, with good blowing engines it is usually reckoned that 80 cubic feet of air per pound of coke are necessary. If the amount of air be calculated from Mr. Gayley's data, that at 114 revolutions per minute the engines supplied 40,000 cubic feet per minute, equal to 57,600,000 cubic feet in 24 hours, we obtain as the amount of air per pound of coke $\frac{57{,}600{,}000}{768{,}626} = 75$ cubic feet. This is 17.5 cubic feet per pound of coke, or 37,364 cubic feet per ton of iron, more than found by the previous calculation. Again, the statements that 69 pounds of water were removed per ton of iron and that this amount would be equivalent to 23,192 pounds of water per day do not agree, as this would make the average production $\frac{23{,}192}{69} = 336$ tons, while that given in the table is 358 tons.

Dr. Luermann shows by calculation that the removal of 69 pounds of water per ton of iron would result in a saving of only 77 pounds of coke, equivalent to 3.58 per cent., whereas Mr. Gayley claims a saving of 421 pounds, or 19.6 per cent. He expresses his disbelief that 2147 pounds of coke are ever used in this country to produce a ton of iron, and in support of his position quotes figures which have been published from time to time of extraordinarily favorable coke practice at Duquesne and South Chicago.

Professor Osann Defends Mr. Gayley.

Dr. Luermann was followed by Professor Osann, who remarked that in view of the statements of some of those present, he quite believed in the accuracy of Mr. Gayley's figures for production and coke consumption, in spite of the discrepancies pointed out by the previous speaker.

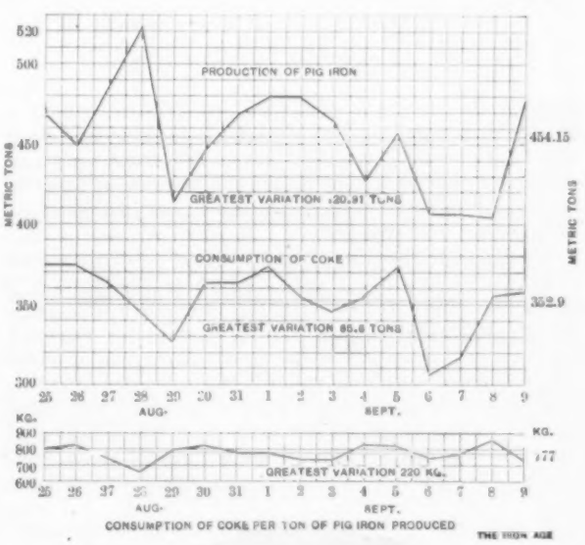


Fig. 2.—With Dry Air.

Regarding the theory of Mr. Schmidhammer, alluded to above, he contended that an error in calculation had been made and that the increased pyrometric effect would be only 114 degrees C., instead of 171 degrees C. Further, that the same result would be obtained by raising the temperature of the blast 140 degrees C., but that it was well known that this would not effect a saving of 20 per cent. of coke, but of 5 or 6 per cent. at most. He suggests that the furnace may have been getting too much coke before, and that the mere fact of reducing the coke caused the furnace to work better. He also suggests that the faster working made possible by the decreased load on the engines is responsible for the lower coke consumption. Finally, he thinks it possible that the valves between the furnace experimented on and its neighbor were not tight and so gave rise to errors.

The S. Obermayer Company, foundry supplies, Cincinnati, Chicago and Pittsburgh, advises us that it has adopted a different name for its new core binder from that stated in our last issue. This binder is named the Esso Gluetrin core binder, and not Glutroid, as previously stated.

* NOTE BY THE TRANSLATOR.—Dr. Luermann seemingly ignores the increased density of the air, owing to its lower temperature, but this, although considerably lessening the discrepancy between his figures and those of Mr. Gayley, does not entirely remove it.

The New Lundell Electric Motor.

An announcement was made in *The Iron Age* of October 27, 1904, that the National Electric Company, Milwaukee, Wis., had effected an arrangement with Robert Lundell to manufacture and market the new motors, generators and systems of operation and control that are covered by his latest inventions. The details concerning the construction of the motors have lately been given to the public, and it is interesting to find that the machine is a striking departure from older forms. The

Fig. 1.—The New Lundell Universal Motor, Showing the Type from 7½ Horse-Power Up. Built by the National Electric Company.

illustrations show the principal new feature, which is the use of a laminated steel magnetic field circuit, while other general improvements are in the design and proportion of the component parts, and have been effective in the attaining of a high efficiency, low temperature, compactness and strength.

The general appearance of the motor, as built in sizes of from 7½ horse-power up, is shown in Fig. 1. Fig. 2 shows the motor frame with the laminated yoke rings and fields, the armature and the end plates removed. This is a cast iron open casing in two parts, one of which is in one piece, with four hollow extension arms of strong cross section, which support the laminations. The other member of the frame is the same with the omission of the extension arms. Bolts passing through these arms secure all members of the frame together and clamp

Fig. 2.—The Motor Frame with All Other Parts Removed.

the laminations, the whole giving a very rigid construction, which is in no way dependent upon the laminations. The arms are placed 90 degrees apart, and in such a way that they do not add to the hight or width of the machine. The advantage of the laminated yoke is that it insures an absolute uniformity of the magnetic circuits, a greater flexibility of speed control, quick field regulation and a more compact structure, the permeability of soft steel being greater than that of cast iron. The pole pieces and the armature core are also of laminated construction, so that in all parts the material most desirable for electrical reasons has been employed. The laminated yoke is built up of punched mild steel rings, the inner and outer diameters of which are concentric, so that they may be accurately centered in the rigid frame just described.

The pole pieces are separately punched from the same material as the yoke rings. They are provided with end plates constructed so as to afford ventilating ducts to carry off the heat generated in the field coils. These end plates are tapped and retaining bolts passed through the frames, as shown in Fig. 3, accurately seating the pole pieces and causing them to make perfect contact with the inner diameter of the yoke rings. By removing these plates the pole pieces and field coils can then be readily removed.

In the machines up to 60 horse-power it is claimed that it is not necessary to allow for ventilation in the center of the armature, as the losses are exceptionally low in this line of machines. For the same reason it is possible to inclose these motors up to fairly large sizes without an excessive rise of temperature resulting in the armature. The armature coils are form wound, and are separately insulated independently of slot insulation. Supporting rings cast in one piece with the end plates of the core serve to hold the ends of the armature coils

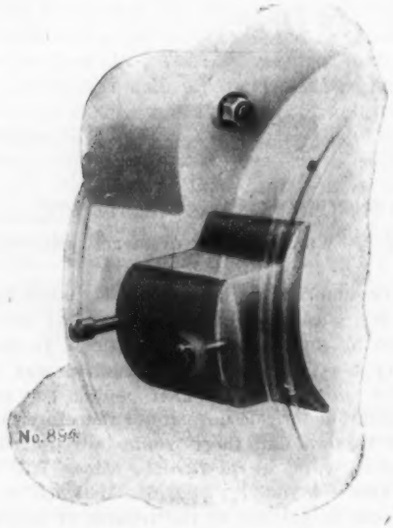


Fig. 3.—Detail Showing a Pole Piece and the Manner of Securing it in Place.

firmly in place. A view of the armature removed is shown in Fig. 4. The commutator shells are ventilated through their centers, which construction aids in the attaining of cool running.

The brushes and brush holders also embody a new principle. Instead of placing the brushes side by side on the stud in a line parallel with the commutator bars, the new Lundell brushes are placed one in front of the other or in tandem. The total brush surface and the commutator space covered is the same as in the side by side brushes, and each brush has its independent tension spring. An advantage of this arrangement is that any irregularity of the commutator surface cannot cause both brushes to break contact at the same time. While one might rise the other is still making contact, and the circuit is always closed for that stud. Where field control is used to obtain broad ranges, required by variable speed work or where conditions of service call for special commutating conditions, the brush at the leading edge is made of high resistance carbon to diminish sparking, and the other brush of high conductivity to carry the greater part of the current.

It is claimed for the new motor that the magnetizing losses in the iron and the resistance losses in the winding, commutator and brushes are so low, due to the economical proportioning of these parts, that the motors run cool without any forced ventilation. When running

under full load continuously, it has been found that the temperautre rise is so low that the quality of the insulation is not impaired, and it is possible to carry heavy overloads for long periods without injury. The brushes also assist in making this possible, as they prevent sparking, which would damage the commutator or the brushes. The motor in its standard form is capable of considerable speed regulation by field control, where it is wanted to drive machinery or tools with a variable speed. The maker recommends that a range of speeds, the limits

Fig. 4.—The Armature.

of which are represented by the ratio of 3 to 1, be obtained by field control. This covers most practical cases.

A feature in the construction of the motor is its short length between bearings, made possible by the high quality of the material used for the magnetic circuits. The same makes the armature shaft extremely stiff against deflection, but it is, however, made of cold rolled steel and of large diameter to enhance its strength. The bearings are of large area and oil rings are provided to conduct the oil from the wells to the armature shaft. Cast iron covers directly over the rings permit of inspection, and a special oil plug prevents an overflow of oil into the motor when the bearing boxes are filled.

The Warwick Iron & Steel Company.

Following is the annual report of the Warwick Iron & Steel Company, Pottstown, Pa., which has just been issued:

The total product of pig iron for 1904 was 125,933 gross tons, as follows: No. 1 furnace, 41,198 tons; No. 2 furnace, 84,735 tons.

No. 1 furnace was blown in March 14, after being fitted with firebrick lining and sundry other repairs. Ore bins for No. 1 furnace were completed in June at a cost of $17,139.38. The use of the bins shows a saving in labor at the rate of over $5000 per year, thus making a reduction in the labor charge at this furnace of about 10 cents per ton of iron.

No. 2 furnace was blown out June 4. The working of the furnace for the month previous indicated that the firebrick lining was in bad condition. The consumption of and demand for iron having fallen off to such an extent that it was found impossible to sell the product of No. 2 furnace at any profit, advantage was taken of this fact to blow out the furnace, replace the firebrick lining and to strengthen and improve such parts as experience had proved to be desirable. The total product for the first blast of No. 2 furnace was 328,251 tons, from October 6, 1901, to June 4, 1904. The furnace was blown in the first week of November, and has been producing iron at the rate of 3000 to 3300 tons per week, as compared with an average of 2000 tons per week for the first six months of the previous blast. The increased tonnage is due chiefly to improved facilities for handling ores and coke, better railroad terminals, as well as betterments connected with our own appliances, the knowledge that comes with experience, and last, but not least, an organization wherein every man is acquainted with the requirements of his position. This can be effected only after many and repeated trials and changes of employees, and is really a process of education that every plant must undergo. It is costly, and by so much becomes a valuable asset.

The year 1904 was far from satisfactory. The average price of monthly shipments of iron declined month by month from January to November. The problem of operating our furnaces successfully, involving as it does the handling of about 70,000 tons of raw material per month, will be simplified when the railroad companies get into shape to furnish cars and motive power to handle the freight traffic without the serious interruptions and delays that have been characteristic for the past three winters or more.

The results of the year's work, as per balance sheet, show a profit on the manufacturing operations, after deducting interest charges, &c. The profit, though small, is more appreciated by those familiar with the business of 1904 than by stockholders having no acquaintance with, and not in personal touch with, the adverse conditions.

The cost of actual repairs was provided for by an accumulated fund, which, while used in our business as cash capital, had been deducted from earnings month by month in the shape of a constant charge to the cost of iron. While our cash working capital has been drawn upon, commensurate with our expenditures for repairs and improvements, yet the plant as a whole is in a better and stronger condition than ever before.

The outlook for 1905 is excellent. There is danger, however, that costs of manufacture may be increased beyond the limit at which consumption of pig iron can be maintained at a maximum, with the same results as were experienced the summer of 1903 and months following. Present market prices for iron, based upon present and prospective costs, should yield a fair margin of profit. It is therefore hoped that the business of 1905 will show a handsome surplus.

During the year bonds to the amount of $15,000 were paid and canceled, leaving the outstanding bonds $270,000.

The balance sheet, as of December 31, 1905, is as follows:

Assets.

Real estate, plant and equipment account		$1,735,204.38
Pig iron on hand—527 tons at $15 per ton		7,905.00
General stock at furnaces (duplicate parts of machinery)		16,743.00
Bills receivable—notes for pig iron not discounted		10,852.94
Cash in bank		98,436.68
Iron making materials on hand—ore, coke, coal, &c.		259,758.83
Accounts receivable—shipments of pig iron, &c.		220,821.33
Improvement account—improvements to No. 2 furnace		34,279.82
Total		$2,384,001.98

Liabilities.

Capital stock		$1,455,815.00
Bond account		270,000.00
Profit and loss account:		
Balance January 1, 1904	$252,006.40	
Sundry credits during year	76.21	
		252,082.61
Pig iron account:		
Earnings for the year, after deducting all charges	$58,853.73	
Less interest on bonds and borrowed money	25,114.85	
Net earnings after deducting all charges	$33,738.88	33,738.88
Bills payable		228,993.74
Accounts payable for book accounts for December		143,371.75
Total		$2,384,001.98

Edgar S. Cook is president, William S. Pilling is vice-president and Wm. H. Shelmerdine, Harry C. Francis, F. W. Tunnell, F. H. Bachman and Philip Doerr are directors.

The Pennsylvania Railroad Company has sent out specifications for the construction of part of the land sections of its tunnels through the New Jersey, New York & Pennsylvania Railroad, which has supervision over the New Jersey end of this project. Bids are asked until March 6 for the construction of the tunnels through Bergen Hill, N. J., which are to be 6600 feet in length and which are to extend from the west side of Bergen Hill, where the road comes out in the open, to the portals of the tubes under the North River. The estimated cost of the work, which is to be started in the spring, is $5,000,000. This leaves only a small portion of the work under Manhattan Island to be advertised.

The Battle Ship Competition.

Report on the Contest by the Bureau of Labor.

WASHINGTON, D. C., February 7, 1905.—The Department of Commerce and Labor has completed the investigation ordered by the House Labor Committee of the question of the desirability of the enactment of the so-called Gompers Eight-Hour bill, and the report thereon has been forwarded to Congress. It will be made public after the committee has had an opportunity to examine it in detail. The correspondent of *The Iron Age* is in position to state that the findings of the Commissioner of Labor, while not conclusive, nevertheless suggest clearly the unwisdom of an attempt to change the laws of trade by so drastic an enactment as is proposed in the Gompers bill. The investigation, therefore, will probably serve to strengthen the opposition to the bill in future Congresses, for it is a foregone conclusion that the measure cannot be passed prior to the adjournment of the present Congress on March 4.

The Connecticut-Louisiana Contest.

While the text of the main report on the Gompers bill is not yet available, the results of a careful inquiry made by the Labor Bureau into the construction of the battle ships Connecticut and Louisiana, which are being built at the New York Navy Yard and at the yard of the Newport News Shipbuilding & Dry Dock Company, respectively, may be here presented. The data given are exceedingly interesting, and while the mere statistical statement made would seem to demonstrate the superiority of the eight-hour system as applied to shipbuilding, the reasons for this apparent advantage, as set forth by the Labor Bureau, are so conclusive as to form a complete offset. The extraordinary circumstances surrounding what is really a one-sided contest—for it does not appear that the Newport News Shipbuilding & Dry Dock Company has made any effort other than to build the best possible vessel at the least possible expense without regard to the amount of work performed per man per hour—furnish a sufficient explanation of the figures presented, while the question, vastly more important than any determined by this inquiry, as to the comparative cost of constructing the two vessels remains undetermined. Following is an abstract of this interesting report:

Summarizing the results of the comparison of the hull construction of the two battle ships in a comprehensive form, the average man at the navy yard, New York, accomplished as much every ten minutes of the time as the average man at Newport News accomplished every 12 minutes and 25 seconds, but in a day of ten hours the average man at Newport News worked in two-tenths of a pound more than the average man at the navy yard in a day of eight hours. Wages are not considered in this statement.

The dimensions and specifications for both battle ships are identical in all their parts. The purpose of the act of Congress in having one ship built in a private yard where a ten-hour work day prevailed and one in a Government navy yard where an eight-hour work day was in force was to enable comparisons to be made of time and cost. Through the courtesy of the Newport News Shipbuilding & Dry Dock Company and the naval constructors at the Navy Yard, New York, acting under the authority of the Secretary of the Navy (such authorization having been obtained through the Commissioner of Labor and the Secretary of Commerce and Labor), a special agent of the Bureau of Labor was enabled to compare the results of the eight-hour and ten-hour work days at the respective yards.

The work of a contract built battle ship consists of the building of the hull, the machinery, certain equipment work such as electric plant, interior means of communication, &c., fitting in place heavy armor plate furnished by the Government and the installation of the ordnance, together with furnishing and installing certain parts of the outfit, &c. It was determined by the Newport News officials that the building of the hull afforded the best and most available basis of comparison and they courteously agreed to compile the weights of the structural material worked into the hull and the aggregate hours of all labor employed on the items of hull construction specified by them. That the Navy Yard officials might be enabled to prepare a similar compilation of weights of structural material used and the aggregate hours of all labor employed the Newport News officials furnished from their printed classification record the detailed specifications of all work done and charged in their classification to the battle ship Louisiana.

On July 15, 1902, 15 days after the act of Congress was approved providing for these battle ships, the Bureau of Construction and Repair of the Navy Department issued specific and detailed instructions to the Navy Yard at New York providing for the material and labor accounts of the battle ship Connecticut and subdividing the execution of the work into a number of specific job orders, in which the work to be done under each was clearly defined. This detailed record and a card system enabled the Naval Constructor and accounting department at the Navy Yard to classify readily and accurately the items specified in the Newport News classification for the Louisiana, with the same items for the Connecticut.

Hand Work Alone Considered.

In this report no other factor is considered than the productive ability of two bodies of men, directed by their respective superintendents, doing exactly the same kind of work, using exactly the same kind of material and the same kind of tools. It is practically all hand work, as the table of occupations and percentage of work done by each presented below indicates. The output of automatic machines with their speed limitations in production per hour does not enter into this work. Special attention is called to this latter condition. The aggregate hours of all persons employed in working into the battle ships the structural materials of the hull, with the weights of such material, make up the complete record:

Occupations.	Per cent. of total hours worked.	Occupations.	Per cent. of total hours worked.
Riveters and helpers	47.63	Steam engineers	0.13
Fitters and helpers	20.93	Machinists and helpers	0.09
Drillers and helpers	10.64	Plumbers and helpers	0.09
Boat yard laborers	6.93	Boiler makers and helpers	0.05
Ship shed men and helpers	6.45	Laborers, other	0.02
Anglesmiths and helpers	5.39	Joiners	0.01
Ship carpenters and helpers	1.15	Outfitters	*
Blacksmiths and helpers	0.49	Total	100.00

* Infinitesimal.

The keel of the Louisiana was laid February 7, 1903. She was launched August 27, 1904. On the day of launching the percentage of hull work completed was 54.5. The keel of the Connecticut was laid March 10, 1903. She was launched September 29, 1904. On the day of the launching the percentage of hull work completed was 53.59. The rapidity with which the work has been carried on can probably best be noted by a comparison between the elapsed time from laying of keel to launching of our existing first-class battle ships and that of the Louisiana and the Connecticut. Statistics are appended to the report which show this time to have ranged from 533 days in the case of the Alabama to 1135 days in the case of the Georgia. It should be remembered that the tonnage of the Alabama was but 11,565, as against 16,000 for the Louisiana and Connecticut. These figures indicate that the work of the Newport News Company on the Louisiana, with far greater tonnage displacement, surpasses that of all others, with the Connecticut two days behind.

The proportion of hull construction completed to date of ending of the report can be compared with the total weight of hull complete and total tonnage of ships, as shown in the following table:

Weight of Completed Battle Ships.

	Tons.		Tons.
Hull, complete, steel and wood	6,352.09	Ordnance	1,338.91
Hull fittings	755.45	Equipment	350.80
Protection	3,991.95	Outfit and stores	477.31
Steam engineering	1,500.00	Coal	900.00
Reserve feed water	50.00	Margin	513.49
Total displacement, tons			16,000.00

Material Worked Into Vessels.

The structural material worked into the hull of the Louisiana at Newport News from the laying of the keel to September 1, 1904 (four days after launching), was carefully calculated. The total gross weight of the structural material worked upon was 14,295,965 pounds. The weight of the net or finished material worked into the hull was 12,216,154 pounds. The aggregate hours of all employees engaged upon this work was 2,413,888. The total gross weight of the structural material worked upon in the building of the Connecticut was 14,173,894 pounds. The weight of the net or finished material worked into the hull was 11,391,040 pounds. The aggregate hours of all employees engaged upon this work was 1,808,240.

From the foregoing data, compiled and verified by the officials at both shipyards, with independent verification of navy yard hours and weights from totals of pay rolls and from Bureau of Construction records, the following comparisons are made:

Gross weight of structural material used: Louisiana, 14,295,965 pounds; Conrecticut, 14,173,894 pounds.

Weight of net or finished structural material worked into hull: Louisiana, 12,216,154 pounds; Connecticut, 11,391,040 pounds.

Aggregate hours of all employees engaged upon the work: Louisiana, 2,413,888 hours; Connecticut, 1,808,240 hours.

Dividing net pounds of material finished into ships by the actual aggregate hours of employees who worked it in, the following comparison is obtained:

Average number of pounds worked in in ten hours: Louisiana, 50.608 pounds.

Average number of pounds worked in in eight hours: Connecticut, 50.396 pounds.

Average number of pounds worked in per hour: Louisiana, 5.0608 pounds; Connecticut, 6.2995 pounds.

Dividing the aggregate hours worked by the actual working days in the period, a daily average number of men working ten and eight hour days full time each for the total number of days is obtained, as follows:

Daily average of men working full time days of ten hours: Louisiana, 500.8 men.

Daily average number of men working full time days of eight hours. Connecticut, 470.9 men.

Resulting average number of net pounds per day, all employees: Louisiana, 25,344.49; Connecticut, 23,731.48.

This comparison shows that the average production per man per hour on the Connecticut exceeded by 24.48 per cent. the average production per man per hour on the Louisiana, and in the opinion of the Labor Bureau explains why the progress on the Connecticut in the reports of percentage of work completed to the Bureau of Construction and Repair has kept pace with the percentage reports of work completed on the Louisiana.

Results Explained.

The work on the Louisiana has been performed in the regular way and under normal conditions, while that of the Connecticut indicates the putting forth of unusual and extraordinary effort and energy. The reasons why this should be so called for further inquiry into prevailing conditions and elicited the following:

1. Higher rates of wages are paid at the navy yard than by private companies in Greater New York and elsewhere, and the rates of the latter average higher than private companies elsewhere.

2. Employment the year round is steadier and more secure than in private yards.

3. The higher wages, shorter hours and steady employment attract the best grade of workmen to the navy yard, where a tacit recognition of an asserted economic theory prevails, that the best workmen cannot be induced to work extra hard without larger pay than the average.

4. Prompt recognition of good work by advance in wages and promotion in grade.

5. A large waiting list of mechanics and others from private shops to select from.

6. The expectation or belief that if the Connecticut was built in record time the building of another battle ship would be given the Brooklyn Navy Yard.

7. A zeal generated by the general challenge of the country to the navy yard workmen to make good their claims in this test.

8. Prompt discharge for inefficiency.

9. Dismissal of workmen who could not or would not come up to a required standard of output in quantity and quality.

10. No restriction of output individually or collectively.

11. Loafing, soldiering or "marking time" not tolerated.

12. Workmen required to begin work the moment the whistle blows and to continue working until the moment the whistle blows at quitting time.

13. Strict technical and exacting supervision of a high order of skill and experience.

14. A desire on the part of naval constructors and workmen to remove an impression of inefficiency growing out of former navy yard construction of war vessels, before civil service regulations controlled employment there.

Not An Eight-Hour Argument.

The report closes with the following pointed comment:

"Former investigations of industrial conditions, together with facts brought out in this, lead to the following conclusions: Notwithstanding the remarkable achievement of the naval constructors and the workmen at the navy yard, probably unsurpassed in American industrial history, and the other notable examples in some of our great establishments in bringing out the best efforts and energy of their employees, it does not follow, when the facts presented by manufacturers are considered, that an eight-hour work day is possible under prevailing conditions or that labor unions and shop management in general have reached a plane that would make it possible."

W. L. C.

Standard Screw Cutting Lathe.

A new standard screw cutting lathe, built by Armstrong, Whitworth of Manchester, England, has just been erected at the National Physical Laboratory at Bushey House, London. The standard screw made of compressed steel and some 6 feet in length has nothing in its appearance that would suggest delicacy of construction. The lathe to which it is attached exceeds 20 feet in length, and as it works to so fine a degree of accuracy as to correct an error of 1-10000 inch, every precaution has been taken to protect it from varying temperatures by housing it in a special building heated to a constant temperature of 60 degrees. The lathe differs greatly in construction from an ordinary lathe. The lead screw and the screw to be cut are coaxial. No gear wheels are employed and there are means for automatically correcting even the most trifling errors of the lead screw. The lathe room, which is air tight except for the ventilation inlets and outlets, is completely surrounded by an outer shell, and is provided with a glazed roof partition at one side enabling observations to be made from the outside of the room. To prevent vibration the lathe has been fixed on a foundation consisting of 20 tons of concrete, covered with 6 inches of Cork stone. Power is supplied by a 5 horse-power motor, and arrangements are made for driving the lathe mandrel direct from the outside of the room. In this way the presence of a human being within the lathe room can be dispensed with for considerable periods at a time, and the machine, with its automatic corrector, can under vigilant supervision from without be safely left to perform its task with marvelous precision. Everything possible is done to maintain an even temperature, and to this end the room is as far as possible kept clear of human occupants, while water pipes on either side of the lathe are employed whenever necessary to reduce the temperature.

A new life saving belt which is very light in weight has been recently tested in France. It is worn under the vest and contains four strong sacks connected by a tube containing a charge of calcium carbide. When the wearer falls into the water the resulting moisture generates at once enough acetylene gas to fill the sacks, and this provides a sufficient amount of buoyancy to enable the wearer to keep his head and shoulders out of the water for an indefinite time. When uninflated by the gas the belt may be worn under the vest without its presence being even suspected by the wearer's companions. It may thus be kept in place during an entire voyage, and will be always ready when required.

A course in chemical engineering has been established at Columbia University, New York City, leading to the degree of chemical engineer. This course will go into operation at the beginning of the next academic year. In connection with this course the sum of $10,000 has recently been given to the university to establish and equip a laboratory of electrochemistry in Havemeyer Hall.

Valve Improvement in Cowper Hot Blast Stoves.

The illustrations given herewith show a valve improvement for Cowper hot blast stoves invented and patented by E. J. Windsor Richards and Thomas Lewis, Glengarnock, Scotland. These valves are designed for the purpose of cleaning and keeping clear the checker work as well as regulating the heat, blast and draft of the stoves.

A great deal of difficulty is experienced by managers of blast furnaces in keeping Cowper hot blast stoves clean wherever much dust is carried over by the furnace gases to the stoves. This dust adheres to the checker work in a gradually increasing thickness, especially toward the top, which so reduces the area of the flues that the heating capacity steadily becomes less, until the efficiency of the stove is practically rendered useless. The present method of cleaning a stove, by firing a gun or by blowing it through with a blast, is quite ineffective, as often when the stove is examined after such a cleaning it will be found that only a limited area, perhaps not more than

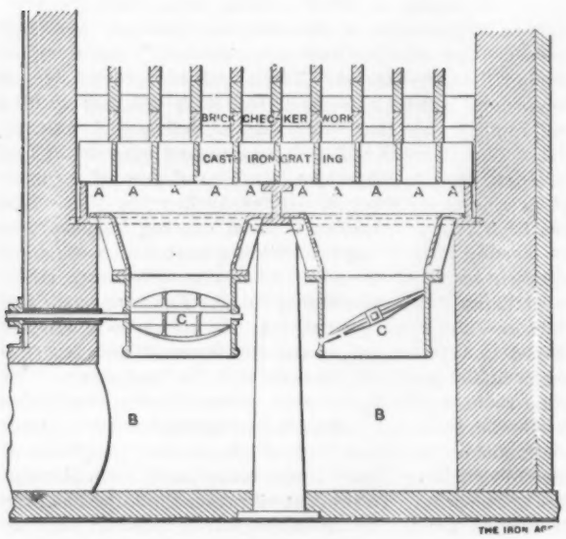


Fig. 1.—Vertical Section of Base of a Fire Brick Stove with the Richards and Lewis Valve Improvement.

one-sixth, around the outside edge has been cleaned. The only thorough way of cleaning at present in use is by laying off the stove, allowing it to cool and then cleaning it by hand labor. This is quite an expensive method, and, further, the use of the stove is lost during the cooling and cleaning as well as during the time when the dust is collecting. To prevent this loss of time and to clean the stove cheaply and efficiently is one of the objects aimed at in the valve arrangement illustrated.

Fig. 1 shows a vertical section of the base of a fire brick stove constructed in accordance with this invention. The letters A represent the inlets to the flues in the checker work. The letters B refer to the chamber in which the cold air blast is admitted. The letters C designate valves of suitable form through which the air blast passes on its way to the vertical flues through the checker work. In lieu of introducing the air blast direct into the heated honeycomb filling of the stove this arrangement causes the blast to enter the chamber B and pass through the valves C. These valves are, say, six in number, as shown in Fig. 2, which is a horizontal section of this portion of the stove. When the passages of the checker work become choked all the valves are to be closed; then one or the other is rapidly opened and closed, thus causing the whole blast to travel through one-sixth of the passages at a time. The force thus confined to an increment of the whole blast effectively removes the obstruction, which would not be the case if the blast were acting on all passages at once, in which case no more passages would be cleaned than correspond with the area of the air duct. The dust can either be blown out through a valve on the dome or down through the gas valve, as commonly done at present, or into a main dust collecting tube. When once cleaned the passages can be kept perfectly free by opening the valves at set intervals.

The frequency and ease with which the stove can be blown through will insure that the dust will never be left lying long enough on the checkers to become fused on, which is a constant source of trouble in stoves at present. Even at works using a clean gas in their stoves, such as a plant with coal fuel furnaces with ammonia recovery, or in a coke fuel furnace with gas cleaning plant, this valve arrangement is still claimed to be advantageous, for by means of it the draft and heating can be regulated at will. In the ordinary Cowper stove, even when perfectly clean, the area of the checker work is so much larger than the chimney valve area that the tendency is for most of the products of combustion to pass through only a portion of the stove and not distribute themselves over the whole area. In this way a great part of the value of the stove is lost. With the auxiliary valve arrangement,

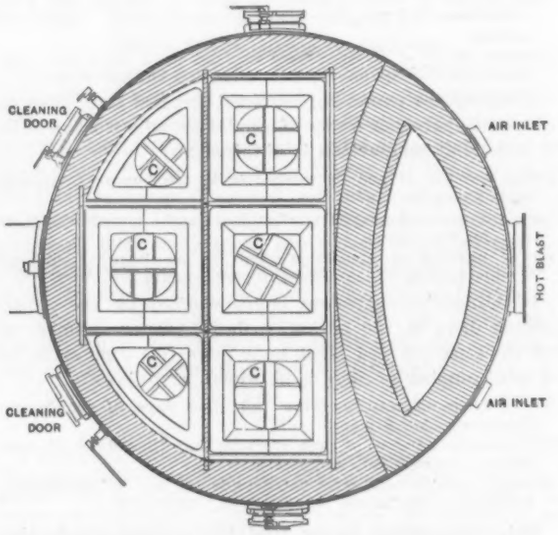


Fig. 2.—Horizontal Section of Fire Brick Stove through the Valves.

however, it is possible so to direct the gases as to heat the entire checker work evenly. Thus the stove can be started with three of the valves open, and as soon as the first portion is judged to be sufficiently heated the other three valves can be opened and the first three closed.

It will also be a well-known fact to furnace managers (more especially in those plants where each furnace is isolated) that there often arise conditions when it would be a decided advantage to the furnace to lower the temperature for a short time, and yet be able, on the shortest notice, in case of a reaction taking place, to obtain instantaneously the highest possible heat. This, it is claimed, would be possible with the valve arrangement described, for by allowing the cold blast to travel through a section only of the stove it would soon exhaust all the available heat, while a large amount of heat is stored up in those sections which are closed and is thus available for a sudden emergency. It will be seen, then, that by adopting this method fewer stoves will be required, as the cleaning can be effected in five minutes, thus obviating the necessity of laying off the stove and waiting for it to cool to have it thoroughly cleaned; also the fullest advantage can be taken of the available heating surfaces, and, moreover, the blast can be kept at a much more even temperature.

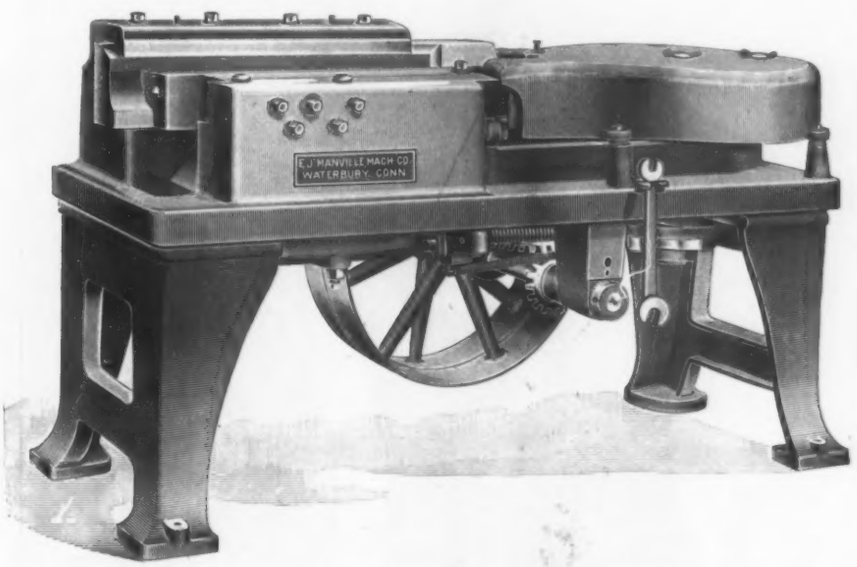
Two stoves at the Glengarnock Iron & Steel Works, Scotland, have already been fitted with this arrangement, and it is stated that they are giving excellent results, fully repaying the reasonable outlay necessary for the installation. As the requirements of present blast furnace practice necessitate a higher and more even temperature, it has made many firms consider the question of adding more stoves, and as a new stove cannot be built for less than the outlay necessary for fitting several existing

stoves with this arrangement, it is pointed out that the same expenditure of capital would not only give better results in working a blast furnace, but would also involve less outlay in labor for cleaning.

A New Three-Quarter Inch Thread Rolling Machine.

For rolling screw threads a machine is required which will support an adjustable, stationary, grooved plate or die, and carry a reciprocating die parallel with it. Between these two grooved plates the rod or blank to be threaded is rolled and passed longitudinally. To force up threads on metal requires considerable pressure, so the first requisite in such a machine is rigidity. Next in importance is power, and, finally, long wearing qualities.

The machine illustrated herewith is designed and proportiond to roll ¾-inch bolts, and the dies are of sufficient face to roll a threaded length of 3½ inches on screws of this size. Under the gear case at the right is placed a crank plate having gear teeth on its rim. This plate gear is carried on a large pendent shaft supported in the frame casting, and is rotated by a steel pinion on an upright driving shaft. The latter is in turn driven through a pair of bevel gears by the horizontal pulley shaft below. From a large crank pin in the upper face of the plate gear a substantial connection unites the crank and the reciprocating moving die slide.



A New ¾-Inch Thread Rolling Machine, Built by the E. J. Manville Machine Company, Waterbury, Conn.

Another way of connecting these parts would be through a Whitworth variable motion, but by so doing it has been found that nothing is gained and complication results. Such a mechanism would not increase the power of the machine, but would merely give a slight change in relative velocity during the various parts of the stroke. By both mechanisms the actual work would be done in approximately a half revolution of the crank plate, therefore the simple crank was considered the most satisfactory.

The crank is made to revolve in a horizontal instead of in a vertical plane as in a steam engine, and from left to right, like the hands of a clock, in order that the slide may receive the pressure or wear on its back surface. If made in the other form this resultant pressure would be on its lower side, and it is found best to take both the pressure due to the squeeze of the dies and the back pressure due to driving on the large, well fitted and amply lubricated back surface of the slide.

With some classes of work to be threaded it is permissible to push or start the work into the dies by a positive acting mechanism, while with others a yielding pressure is required. This machine is provided with a starting device or pusher, so constructed that either condition can be obtained by a simple rearrangement of parts, and the timing of the pusher and dies is readily accomplished by adjusting the operating cam, located on the lower end of the crank plate shaft, and easily accessible.

This machine weighs 5300 pounds, and is back geared 9 to 1. It is the latest and largest of the several sizes which have been brought out by the E. J. Manville Machine Company of Waterbury, Conn.

The Electric Controller & Supply Company, Cleveland, Ohio, has recently put on the market a new type of magnet for handling pig iron, small billets, scrap iron or steel, small steel or iron castings, bolts, rivets, &c., in bulk, which is the result of protracted experimenting to get the most efficient design. It is adapted to be carried on the hook of a crane and controlled by the crane man, who can thus perform the entire operation of loading or unloading a car or loading melting stock into charging boxes with no ground men or helpers. This type of magnet, which is radically new and is covered by letters patent, has so effectively supplied the demand for a means of reducing the cost of handling such raw materials that the company is experiencing a heavy call for it.

Kerosene as a fuel for internal combustion engines is obtained by distilling crude petroleum, the result showing about 1 pint of the refined kerosene for each 3½ pints of the crude raw material. The heating value varies from 22,000 to 24,000 British thermal units per pound, depending somewhat upon the composition. In general, the quicker the distillation the poorer the kerosene, though the quantity obtained is liable to be greater. The "burning point" is placed between 130 and 140 degrees F.; the boiling point anywhere from 300 to 500 degrees F. When boiled a vapor density is observed equal to five times that of air, and the requirements for combustion call for almost 190 cubic feet of air to each pound of fuel.

More than 40 submarine boats of various sizes and descriptions are now in service or under construction for the French Government. Three of the latest, known as "X," "Y" and "Z," are in the nature of experimental boats and are of different sizes, the displacements being respectively 168, 213 and 202 tons. In these boats an attempt has been made to combine the advantages of the submarine boat proper with those of the "submersible," and to avoid the disadvantages of both. "X" has a length of 123 feet, a beam of 10¼ feet and a draft on the surface of 7½ feet. She will have accumulators for electric power when submerged, and some type of gas engine for use on the surface, the engine being of about 220 horse-power, and the designed speed 10.5 knots.

The International Kerosene Engine.

The kerosene engine is desirable for many purposes because of its low initial cost and its cheap and comparatively safe fuel. A simple form of the kerosene engine, manufactured by the International Power Vehicle Company, Stamford, Conn., is shown in the accompanying illustrations. The fuel generally used is ordinary kerosene, but cheaper grades of petroleum may be substituted.

The kerosene engine differs from the gasoline engine in essential details of its mechanism, due to the different natures of the two fuels, kerosene being less volatile.

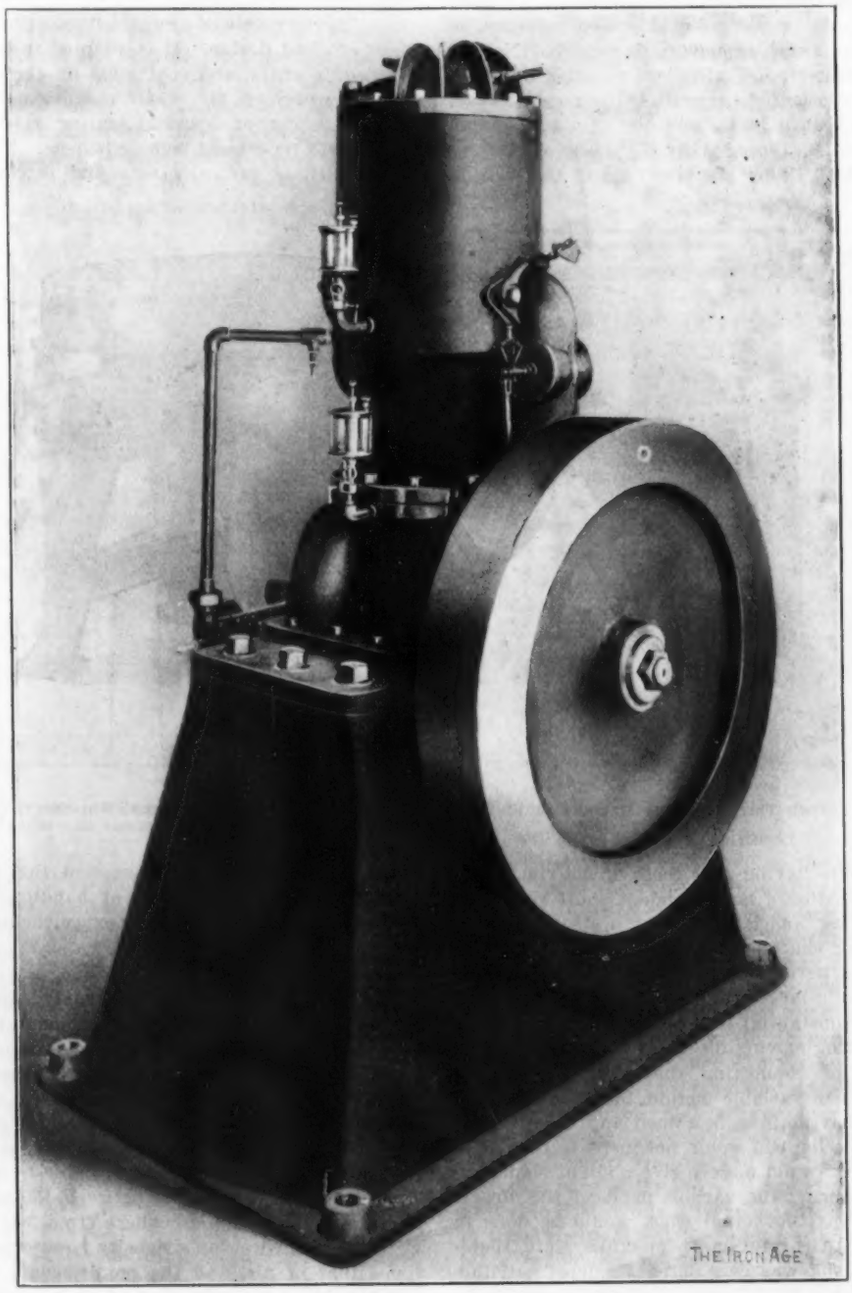


Fig. 1.—The Kerosene Engine Built by the International Power Vehicle Company, Stamford, Conn.

No carburetor is used to convert the fluid into gas. The oil is introduced into the cylinder as a spray, mixed with air and is changed into a gaseous condition within the cylinder before ignition occurs by means of heat which must be within well-defined limits. If the vaporous fuel comes in contact with too great a heat the petroleum is disintegrated, its hydrogen escapes and its carbon deposits in stone-like scales upon the cylinder head, while too little heat will not produce the gaseous condition necessary to perfect combustion.

The engine is shown in Fig. 1, and Figs. 2 and 3 show it in section and the position of the piston when ignition is taking place, and when the exhaust gases are escaping and the fresh charge entering. When the piston has risen nearly to the end of the upward stroke the air inlet A is uncovered, and as there is a partial vacuum in the air tight crank case C the air rushes in. As the piston descends, impelled by the ignited gases, the air in the crank case is compressed, the pressure extending to the passage D, called the air transfer box. The descending piston finally uncovers the exhaust passage, through which the inert gases of combustion escape, impelled first by the pressure remaining in the cylinder, and then by the rush of air through the inlet E, which is opened after the exhaust, as will be noticed in Fig. 2. The moment the inlet E is opened the compressed air in the crank case and air transfer box rushes into the cylinder, driving out the remaining gases, except a small amount left in the cavity holding the firing plug F. This small residue plays an important part in the successful operation of the engine, for it keeps the new charge away from the red hot firing plug until the proper time for igniting. As compression takes place above the piston during its upward stroke, the new charge forces the burned gases further into the cavity, until the new charge comes in contact with the plug and is ignited. The plug

has a screw stem, by which its position in the cavity may be adjusted by a nut on the outside of the cylinder head to correspond to the power required. Withdrawing the plug into the cavity delays ignition, thus furnishing greater power. Advancing it nearer to the opening of the cavity advances the ignition, and less power is developed.

The charge of fuel is introduced through the inlet B, either from a pressure tank or by the suction created by the partial vacuum of the crank case. A check valve prevents the oil from returning through B after it has been admitted. The oil as it enters the engine is received on a gauze screen, H, and by capillary attraction forms a thin film upon it until the entrance E is uncovered and the air rushes into the cylinder, passing through the gauze, taking the oil with it in a very fine spray, so fine that if permitted to escape into the air it would float. The intermingled air and oil spray passing up into the cylinder strikes the hot cylinder head at G. The heat of the metal is not enough to ignite the oil, nor to cause it to "crack," *i. e.*, give off hydrogen and deposit carbon. Instead, this heat converts the oil and air into a gaseous mixture, which is maintained by the heat of compression until the moment of igniting.

The ignition plug replaces the torch, which need be applied only in giving to the plug its initial red heat for the first discharges, after which the heat of ignition is all that is necessary.

For changing the speed of the engine a butterfly valve, shown at J, Fig. 4, in the air transfer box, is employed for throttling and is automatically controlled by the governor, which is of the usual type.

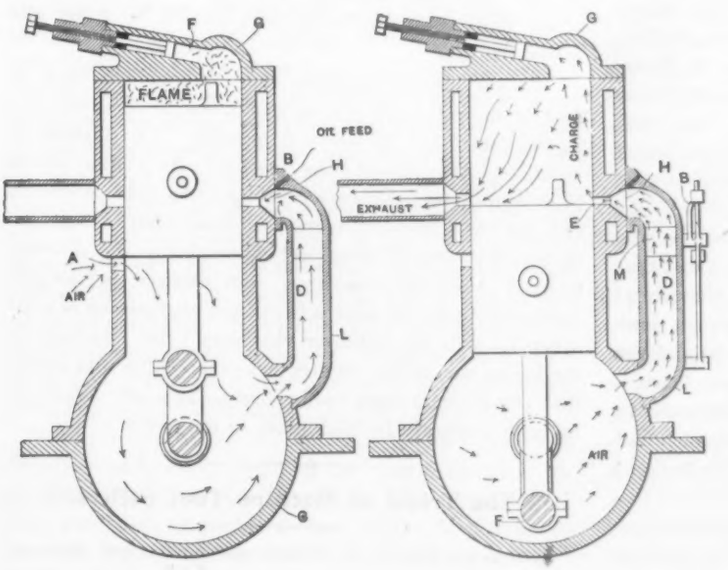


Fig. 2.—Section Showing Position of Parts at time of Ignition.

Fig. 3.—Section Showing Position of Parts During Exhaust and Admission.

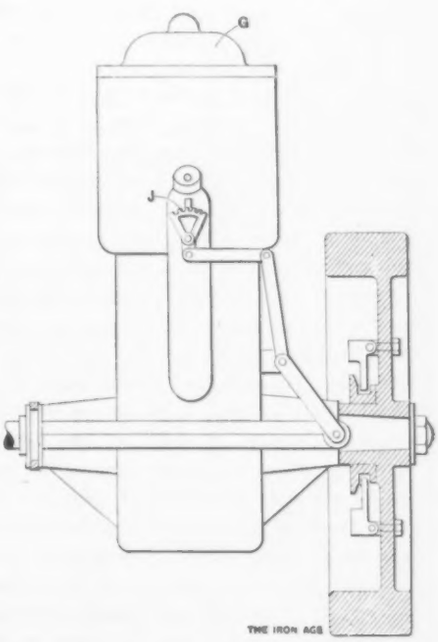


Fig. 4.—End Elevation and Part Section, Showing Governing Mechanism.

The Alabama Consolidated Coal & Iron Company.—The control of this company has passed into the hands of New York interests and the headquarters has been moved from Baltimore, Md., to 74 Broadway, New York, where the company occupies the entire eighteenth floor. The operating offices, however, will remain at Birmingham, Ala., which continues to be the address of the president, T. G. Bush. On the sale of the stock four of the Southern directors resigned and New York business men were selected in their stead. At a recent meeting the following officers and directors were elected: T. G. Bush, president; J. H. Hoadley, vice-president; William M. Hoagland, treasurer; Richard H. Edmonds, chairman of the Executive Committee; Erskine Hewett, Atwood Violett, William C. Seldon, D. G. Boissevain and Edward K. Hill. The company is strongly fortified in the matter of raw materials, and is at present supplying other companies with coke, ore and limestone. It will be its future policy to secure the larger profits made by the manufacture of finished products, and with that end in view the company has commenced the erection of a soil pipe plant at Gadsden, Ala., through its affiliated company, the Coosa Pipe & Foundry Company. It is likely that other plants for making the finished product will be constructed in the near future, but thus far plans have not progressed to the extent that a definite statement can be made.

The cargo of the Great Northern steamship Minnesota, which sailed from Seattle, Wash., January 23, for her maiden voyage to the Orient, is easily the largest ever loaded at a Pacific Coast port. It consisted of 26,000 tons of merchandise, chiefly domestic products, valued at $1,804,633 according to the manifests filed in the customs office. The manifests show among other goods consignments of 400 pieces, boxes, crates and packages of machinery, 146 lathes and boxes of lathes, 35 boxes of castings, 200 boiler tubes, 74 kegs of bolts and 896,117 pounds of copper ingots.

It is estimated by Pittsburgh iron and steel authorities that the producing capacity of the United States Steel Corporation must be doubled within the next ten years to meet the enlarged demand for iron and steel products.

The No. 1 blooming mill of the American Steel & Wire Company, at the Newburgh Works, Cleveland, Ohio, established a new record for rolling 4 x 4 inch billets during January, when 47,980 gross tons were rolled. The best previous record on this mill was made in November, 1904, when 43,860 tons were made.

It is stated that the Cambria Steel Company, Johnstown, Pa., intends to double its capacity for the manufacture of steel cars. At present it has facilities for turning out from 75 to 100 steel cars per week, which are built under patents owned by the Pressed Steel Car Company, Pittsburgh, under a special arrangement with the latter.

The report is officially denied that the Demmler Works of the American Sheet & Tin Plate Company, at Demmler, near Pittsburgh, are to be removed to Connellsville, Pa.

THE IRON AGE

1855—1905.

New York, Thursday, February 9, 1905.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
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German Views of American Industrial Education.

Dr. Jastrow, professor of political economy, Berlin University, sounds a note of warning to his countrymen based on his observations of the presence of educated men in American commercial life. His opinion, published in the annual report of the Senior Merchants' Association of Berlin, is essentially at variance with what the American Consul-General at Berlin reports to be the prevailing idea gathered by German visitors to the United States last year, as printed in *The Iron Age* of last week under the head of the "German View of American Industry." This report indicates that the German visitors found American commercial and industrial education to be superficial as a whole. Dr. Jastrow, according to a dispatch from Berlin, states that he was surprised at the number of college men in American business life, and that he found so many educated men following commercial pursuits that he argues that German business men must have a broader culture in order not to remain behind the Americans. He says that American experiences in commercial education will have an appreciable influence in shaping the course of study at the Berlin Commercial University, which the Senior Merchants' Association will open for students in the fall of 1906.

The trend of college men to go into business is becoming stronger every year. The annual crop of lawyers, physicians and other professional men continues large—too large, it is claimed—so that the average young practitioner, whatever his specialty may be, finds it pretty hard to make a start, to say nothing of a good living. Mercantile and manufacturing pursuits have no limit for the educated man who is able and ambitious. His field will not get crowded. The number of college bred men as compared to those whose education had to cease at an earlier stage will not become too great among the great industrial army. The mercantile life has always been sought by college men, but the manufacturing field has not been taken advantage of to any great extent until quite recently. It is said that undergraduates looking ahead saw the professions filled almost to the limit, and, deciding to go into business, saw that the real opening was in manufacturing.

The college bred man must begin at the bottom, it is true. He must be in dead earnest, ready to subordinate himself to others no older whose practical experience must be for the time superior to the more substantial basis of education. When the graduate has done this he has succeeded in proportion to his natural ability, and, everything else being equal, he has progressed faster than those who had not the basis of a superior education. The experience of those who first tried this experiment was passed along to those that came after at college, until such a career has come to be looked upon as the equivalent in honor and general attractiveness to the professions. The undergraduate has come to shape his college course to prepare himself in as practical a way as possible for business life. This is evident in colleges with the elective system in the number of young men who select Spanish as an essential study, in addition to their French and German, on the ground that knowledge of this tongue of our new possessions and of the countries south of us may be of real business value.

Another very essential change along the same lines is in the establishment of technical high schools and manual training schools. The whole idea of the high school course has changed because of the demand for something more than a routine education to follow the grammar schools, especially for those who will not have the opportunity for a higher education, but also for boys who plan to enter a polytechnic institute or scientific school. Many small cities as well as the larger centers now have such preparatory schools, spending relatively great sums of money in buildings and equipment and for maintenance. So-called Latin-scientific courses are increasingly popular. It is in the technical high school and in semiscientific courses that many boys get the cue that leads them to shape their college training with a view to going into manufacturing.

We are inclined to think that America has little to fear in the future from a lack of properly educated men in industrial and commercial pursuits. Dr. Jastrow is right. At the present time, perhaps, the critics voiced in Consul-General Mason's report may be right in stating that too little attention is paid to those classes of specialization that would carry out scientifically the development of American commerce. But colleges, polytechnic institutes, technical high schools and engineering schools generally will fill whatever void may exist. So long as the young men of the country have the virility and ability that characterize them to-day just so long will American industry maintain its high place in the world.

The Trials of Machine Tool Sellers.

Every machine tool builder and dealer has more or less frequent experiences with the customer who takes a tool on trial or buys it on time, and after using it in manufacturing declines to accept it, asserting it to be deficient in workmanship or capacity. The problem is to ascertain to which class such a customer belongs—the man who honestly believes that the machine is not what it was represented to be, or the man who either wishes to get rid of the tool after he has had some genuine good from it or seeks to get a reduction from the agreed price. The complaint by builders of high class tools is that the latter class is about as numerous as the other, but the dishonesty of purpose is fully as apt to lie with some shop official outside of the office as with the responsible officers who must accept the word of the shop as to the merits of a machine.

Complaints by customers that a tool is a disappointment owing to lack of a complete understanding of the machine are numerous enough, and such instances are easy of adjustment if the fault be with the workman or the shop superintendent, for the representative of the builder of the tool can easily straighten out matters. It may be that some small but important part of the mechanism is out of adjustment, or perhaps in the hurry of setting up a tool for immediate shipment the carelessness of an employee has left something undone that should have been done. Or it may be that an overzealous salesman has gone too far in his guarantees, keeping his home office in ignorance of them, in which case the adjustment of differences may rightfully be a matter of dollars and cents.

It is a more serious complaint that customers willfully decline to accept machines after they have had full use of them for a considerable period, during which time they have accomplished enough of the class of work for which the tool was wanted to enable them to dispense with its services for a considerable time to come. Builders of special machinery have to be on constant guard against this sort of thing, which occurs much oftener than can be realized by those who are not in the machine tool business. It must be said that machine tool builders themselves are seldom guilty of such deception. Generally the complaint comes in a letter stating that the machine will not do its work. In answer to the natural inquiry as to where the tool is deficient the answer is usually a general one, that it "won't work," or is "no good," or some other equally unintelligent explanation. Here is where the expense begins for the manufacturer. He must send a man to investigate and make a report. The report being that the machine is in good running order, or out of order apparently from sheer desire to have it so, the next step is to begin more energetic negotiations. Sometimes at this point the offer is made to take the machine at a reduced price, or hints are thrown out to that effect. Or the point blank refusal to accept the machine at any price requires either the taking back of the machine, which must be done if it is simply on trial, or else strenuous insistence that the price be paid as agreed. There is a tendency to deal too leniently with such cases for fear of incurring ill will. Such leniency is a mistaken business policy, and injures the trade generally. If business men would be rid of those who would take advantage of opportunities to defraud they should deal with them with uncompromising business austerity, and insist that just bills be paid.

There is another phase of this affliction of the machine tool men, which is when the shop foreman or superintendent wishes to be considered in a financial way when purchases of equipment are made. They must be "greased," to use an inelegant trade colloquialism. If they are not thus put in a good humor their efforts are directed toward spoiling the reputation of that particular machine tool builder, and such men know how to do it. They prejudice their employers by insinuation and open criticism. This source of disagreement between the machine tool man and his customer is one that the customer is quick to get rid of as soon as he finds it out, and nowadays it is not so easy to fool him, and the evil is consequently less frequent, but it still exists.

Selling machine tools at long range is a great source of annoyance and disagreement. A New England manufacturer of pipe cutting machines sold one to an Australian customer to go back into the interior, which was an expensive matter of freight alone. Soon after its delivery a letter was received stating that the machine would not work. The reply was that it must work, for it had been carefully tried out in the shop before shipment. Correspondence continued, each interchange of letters consuming several months, the customer all the while insisting that the machine would not work because the centering vise would not correctly align the work. Finally, in desperation the manufacturer wrote offering to take back the machine if the freight charges would be paid by the customer, providing the machine proved to be all right when it arrived at the shop. It cost $350 for the freight on a $250 machine, which made a complete circuit of the globe, and it was found that an Australian workman had removed the vise jaws and in returning them had reversed their positions, throwing the vise more than half an inch out of line with the dies, and yet no one had awakened to the idea that such a discrepancy must have a quick and easy solution. This same manufacturer sent a machine to a Pennsylvania coal mining company and soon afterward received a letter that it "wouldn't work." Letters failed to get a more detailed account of the trouble, and a representative was sent to Pennsylvania to see for himself what the matter was. Arriving on the scene he was told that the workmen were "afraid they would break the machine." He told them to go ahead and he would risk it, and they did and the work went along just as the machine was designed to do it. The manufacturer sent the bill to the coal company for his representative's expenses to Pennsylvania, but it was not paid. The cost of the episode was thus another charge added to the long list of entries under the head of "experience."

Our Record Breaking Gold Shipments.

Last Thursday a French liner sailing from this port carried the largest sum of gold ever sent by a single vessel from this side of the Atlantic. The value of the shipment was $9,130,000. The total gold exports of the week were $11,000,000. The shipments of gold now being made are not only breaking records for single transactions but also for the total outflow of the precious metal. From the latter part of October up to the end of last week the exports of gold have been about $62,000,000, far surpassing all previous movements of the kind in a corresponding period. The nearest approach to that amount was in the three months ending with January, 1896, when about $40,000,000 was shipped to foreign bankers. The recollection of the alarm caused by the heavy exports of that period, which threatened the maintenance of the gold standard in this country, naturally causes the present movement to be regarded with some apprehension, as it has not ended. Exchange rates are still high, and as long as they are thus maintained gold exports will be profitable to those interested in such dealings. The situation, however, is regarded with equanimity by our financiers, who assert that with existing conditions in this country possibly $200,000,000 might be spared from our gold accumulations without serious results. The difference between the present and 1896 is very great. Nine years ago, when gold was being exported so freely, the depreciation in the value of silver was causing serious currency disturbances, trade was rapidly contracting, the abandonment of gold payment for United States Treasury notes was imminent, and gold was being rushed abroad so that its owners might be reasonably certain of getting it again when needed. For years after that experience every recurrence of gold shipments caused anxiety and depressed security values until the public became assured that our financial fabric had been so strengthened that it could not be toppled over by the withdrawal of some of the great stores of gold accumulated in our reserves. Nevertheless, such a huge movement as that now in progress is much beyond any reasonable expectation, and its causes are inciting discussion.

One explanation which seems plausible is that we are experiencing a gold overflow. That is to say, our home production of gold is too large to be profitably used here and the surplus is seeking other outlets. This view of the case is supported by a number of circumstances. Prominent among these is the fact that the supply of money is abundant. So abundant is it that with all branches of trade active, necessarily demanding the most ample funds for prosecuting business operations, call money on Wall Street is freely loaned at the rate of 2 per cent. per annum, so that speculation in securities

is encouraged. Two striking examples of this extraordinary ease in money occurred the past week. One was the payment of $24,000,000 cash in Chicago for the purchase of City Railway stock by the syndicate now reorganizing the street railway system of that city, and the other was the immediate absorption in New York of an issue of $75,000,000 of 4 per cent. bonds by the Southern Pacific Railroad Company, largely intended for refunding purposes, both of which were accomplished without even a ripple in the financial world. The Southern Pacific bond transaction is regarded as the most remarkable of its kind in the history of finance. Without an advertisement, and, in fact, with the mere announcement that such an issue of bonds was to be made, the applications for them were sufficient to exhaust the supply in two hours. The avidity with which these bonds were taken surprised even the bankers to whom the negotiation of the loan had been intrusted. When such large transactions as these can be effected with ease at the very time that an unparalleled gold exporting movement is in progress, it would seem that capitalists see nothing in it to excite immediate apprehension, but that, on the contrary, they feel that the movement is in accordance with natural laws of trade. Another point which supports the theory of a gold overflow is the heavy production of the precious metal in this country, which is one of the leading sources of the gold supply of the world. We are now producing it at the rate of about $85,000,000 a year, as compared with $47,000,000 as recently as 1895. Thus, in 10 years we have fallen only a little short of doubling our gold output. As gold is not popular as currency, and its use in the arts is quite limited, the surplus above the Treasury and bank reserves, when thus heavily increased from year to year, becomes a mercantile commodity which in time must find markets in countries producing little or none of this metal. As gold is now needed in Europe in connection with Russian financial arrangements, inducements are made to influence the flow in that direction. It is conceivable that such a movement could take place, even though this country was strictly a creditor nation. Notwithstanding its universal adoption by the leading nations of the world as the standard of currency values, gold is but a commodity, being as much so as iron or cotton. Those who desire it take the necessary means to get it, and those who produce it are ever ready to exchange it for something which they consider equally valuable or desirable.

Business Hari-Kari.

It is a strange fact that manufacturers who are least favorably situated, mechanically, financially and geographically, to produce economically are usually the ones who quote the lowest prices. Plants that never had a reason for existence where they stand other than the zeal of their promoters and the ignorance of their local backers are scattered all over the country, in locations which alone doom them to failure. Their careers, from the day their promoters leave for new fields and turn over the keys to their victims, are more or less protracted death struggles. Their worried managers, in an endeavor to force trade in a direction in which it was never meant to go, daily commit hari-kari, for the knives with which they cut prices are two edged, letting their own financial blood while seriously injuring the business of their competitors. When, for instance, sheets or wire products are cut in price, who is it that goes the deepest—the factor who controls his raw materials from the ore up or the man who must buy his sheet bars or wire rods at the highest market price? When pipe prices are slaughtered, is not the chief executioner usually the isolated mill that has to pay its larger competitor a good profit on his skelp? When bars are cut to the bone, is it not the antiquated, out of the way mill, with high cost billets or dear scrap iron, that names the lowest price?

The running amuck of such foredoomed plants does more to demoralize prices and to destroy the just profits of legitimate operations than any other factor in the trade. And the worst of it is that, when the resources of one set of owners of such a plant are exhausted and the sheriff steps in, the mill is usually sold for a fraction of its cost to another set of men equally ignorant of the exigencies of the trade, who are enabled by the low purchase price and small fixed expense to continue the hopeless struggle for another term of years, until they, too, have sunk all they care to lose.

The same conditions exist in merchandising. It is the dull salesman who cuts the price, just as it is the dull razor that wounds the face. It is the misfit merchant, ignorant of his fixed costs and proper profits, who demoralizes business in his trade or vicinity while he is digging his own business grave. And when the sheriff auctions off his goods, they, too, continue to exert a harmful influence on the trade until the last dollar's worth finds its way into the hands of consumers.

The Chicago Pneumatic Tool Company.—*Something Pneumatic* for January, the house organ of the Chicago Pneumatic Tool Company, announces that that company has absorbed the Chicago Storage Battery Company, an enterprise that had been started by J. W. Duntley about a year previous. This adds to the line of supplies offered by the Chicago Pneumatic Tool Company a complete line of storage batteries equipped with what is known as the Duntley washable cells. The batteries are being used chiefly now for train lighting, though they are adaptable to a wide range of uses. The same issue announces a new Franklin air compressor having compound steel cylinders and compound air cylinders. These compressors are designed to run noncondensing with boiler pressure 100 pounds to the square inch, each compressor averaging 700 cubic feet of free air when running at a speed of 100 revolutions per minute. The company also announces that it is placing on the market a new valved sand sifter intended especially for shops where heavy work is done. In this device the riddle is suspended from a frame which is agitated by means of a reciprocating pneumatic device. The publication also illustrates the Chicago sand rammer as used for filing slots in armatures. This is in reality a form of pneumatic hammer which is placed horizontally, a file being substituted for a hammer or tamping tool and the armature placed underneath the file in such a way that the reciprocating motion of the tool files the slots.

The interesting statement is made in a report to the Department of Commerce and Labor by United States Consul James H. Worman, Three Rivers, Quebec, that at a recent meeting of the Canadian Manufacturers' Association the presiding officer took occasion to point out how admirably for Canadian interests the new "dumping clause" was working, and how it had recently been applied to a purchase of steel rails by the Canadian Pacific Railroad, by which the importer had to pay on 60,000 tons of steel rails the regular duty of $420,000, plus an extra duty of $210,000.

E. W. Bentley, formerly with the Rust Boiler Company, Pittsburgh, has severed his connection with that company and has opened an office in the Bessemer Building, Pittsburgh, representing the A. D. Granger Company for engines, boilers and other equipment; also the Skinner Engine Company, Erie, Pa.; Bates Machine Company, Joliet, Ill., and Harrisburg Mfg. & Boiler Company, Harrisburg, Pa.

PERSONAL.

Charles A. Bunting, for eleven years construction engineer for the Pennsylvania Steel Company, Steelton, Pa., and later with the Allentown Rolling Mills as superintendent, has accepted the position of superintendent of the Mansfield Engineering Company, Mansfield, Ohio.

Edward L. Harrison, who for the last 15 years has been connected with the Niles-Bement-Pond Company, announces his connection with the Vandyck Churchill Company, 8 Dey street, New York.

Consequent upon the merger of the Simplex Railway Appliance Company with the American Steel Foundries, William V. Kelley of the Simplex Company was elected vice-president, a director and a member of the Executive Committee of the American Steel Foundries.

Major Hugh J. Gallagher, General Staff, U. S. A., who was detailed by direction of the President for service with the Isthmian Canal Commission, has assumed the duties of purchasing agent of the commission, with headquarters in the Washington office of the commission. He has had a wide experience in purchasing supplies for the army and is regarded at the War Department as one of the best informed and most efficient purchasing agents in the country.

A. C. Smith, superintendent of the Cleveland Furnace Company, Cleveland, Ohio, has resigned in order to assume the superintendency of the furnaces of the National Tube Company at Wheeling, W. Va.

J. E. Thropp, Jr., formerly connected with the Duquesne blast furnaces of the Carnegie Steel Company, has resigned his position of superintendent of the Donora blast furnaces of the same company.

George H. Benzenberg, Milwaukee, Wis., formerly city engineer, has been appointed chief engineer in charge of the construction of the new water works system of Cincinnati. Mr. Benzenberg has for some time been identified with this work as consulting engineer and was one of the board of engineers which laid out the plan.

Dr. Richard Moldenke, secretary of the American Foundrymen's Association, read a paper on "Testing Cast Iron" before the mining and metallurgical section of the Franklin Institute, Philadelphia, February 2.

Gilbert M. Smith has been elected president and treasurer of the Manhattan Brass Company, New York City.

A. L. Ralston has been appointed general freight agent of the Crucible Steel Company of America, to succeed C. D. Dyer, resigned.

James H. Gross, for years superintendent of the beam mills of the Homestead Steel Works of the Carnegie Steel Company, has recently been made superintendent of the Howard Axle Works of the Carnegie Steel Company at West Homestead. Last week he was presented with a diamond stud by the employees of the Homestead beam mill.

Charles C. Price, formerly auditor of the American Bridge Company, at Pittsburgh, but who has resigned and will take up his residence in Philadelphia, was presented last week with a fine gold watch and fob by employees of the auditing department of the concern. Frank B. Thompson, formerly assistant auditor of the Carnegie Steel Company, has been appointed auditor of the American Bridge Company, succeeding Mr. Price. A dinner was given Mr. Thompson in the Monongahela Club last week by 25 of his associates in the Carnegie Steel Company, at which he was presented with a handsome gold watch and chain. The presentation speech was made by James J. Campbell, auditor of the Carnegie Steel Company.

Harry F. McMinn has severed his connection with the Colonial Steel Company and has made arrangements to represent the John Illingworth Steel Company, whose works are at Frankford, Pa., and office and warehouse at 25 Cliff street, New York.

OBITUARY.

DAVIS KEELEY, long a prominent furnace manager, most of the time in Eastern Pennsylvania, died at Phœnixville, Pa., January 18. He was born in 1820 and was therefore 84 years of age. In 1842 he was engaged in building pumps and mining machinery in Pottsville. In April, 1845, he made an agreement to do all the furnace building at the Phœnix Iron Works and built two large blast furnaces, besides a number of puddling furnaces. Subsequently he rebuilt one of the furnaces complete from floor to stack in three months, which at that time was considered a remarkable achievement. In 1879 he took charge of a furnace in Morris County, N. J., and equipped it for making a special quality of pig iron for nails and horseshoes. In 1881 he remodeled two blast furnaces in Albany, N. Y., after which he remodeled those of the Merion Iron Company at Conshohocken, Pa. His next work in that line was to remodel the Hooven furnace at Norristown, Pa., his last work being on the Edge Hill furnace at Edge Hill, Pa., after which, in 1888, he retired from active business. His son Jerome Keeley and his grandson Frank J. Keeley conduct a pig iron business at 435 Chestnut street, Philadelphia, under the firm name of Jerome Keeley & Co.

GEORGE H. PERKINS, an inventor prominently connected with the oil trade of the country, died February 2 at Island Heights, N. J., as the result of a long illness following upon an injury received some time ago. Mr. Perkins was a pioneer in the manufacture by machinery of tin cans for the shipment of oil, having factories in New York, Philadelphia and Pittsburgh. Later he became associated with the Atlantic Refining Company, and in his subsequent inventions introduced some material changes in methods of oil refining. He was born in 1839 at Hillsboro, Ill. Mr. Perkins was a member of the American Society of Mechanical Engineers, the Franklin Institute and a number of other technical associations.

HELGE G. FORSBURG, senior member of the firm of Forsburg & Murray, machinists and iron workers, Washington, D. C., died suddenly, on January 29, from heart disease, aged 56 years. He was born at Stockholm, Sweden, and came to America as a child. He had been in business in Washington for many years, the firm doing considerable mechanical work for the Government and for the Potomac River steamers.

HARRISON H. TAYLOR, inventor of the Taylor water tube boiler and of a number of other successful mechanical appliances, died February 4, in Detroit, Mich.

CHARLES H. CADY, who for 12 years ending last May was general manager for Witherbee, Sherman & Co., Mineville, N. Y., died of apoplexy at Ballston, N. Y., January 28, aged 59 years. He was born in Oneida County, N. Y., spending his boyhood on a farm. Thence he went to Cleveland for his education, where his family subsequently resided. His first work was with the Cleveland Woolen mills as superintendent, which position he filled 10 years. With the closing of the company's business he went to Marquette with the Cleveland Iron Mining Company, where he stayed two years, after which he accepted the position of manager of the Chapin Iron mine, where he remained 10 years. His health having failed, he passed last winter in the South, but the improvement realized was but temporary.

JAMES CLINTON SPENCER, vice-president of the Northwestern Iron Company, Milwaukee, Wis., died February 2, at Miami, Fla., from bronchial pneumonia, aged 75 years. Mr. Spencer was for many years a railroad construction engineer and was identified with the building of the Erie Railroad in 1848, the Hudson River Railroad in 1849 and the Chicago & Alton in 1852. In 1861 he was appointed manager of the Milwaukee & Prairie du Chien Railroad, now a division of the Chicago, Milwaukee & St. Paul. In 1879 he became receiver for the Milwaukee & Northern. Since 1875 he had been a consulting engineer of the Pittsburgh, Fort Wayne & Chicago. For several years he was president of the Milwaukee Club.

Trade Publications.

Foundry Chaplets and Anchors.—W. W. Lindsay & Co., Harrison Building, Philadelphia, Pa. Pamphlet. Describes the manufacture from soft steel of the McCoy & Lukens double head chaplet and single head anchor, and lists the sizes and forms in which they are made.

Paradigm Skylights.—Arthur E. Rendle, 428 Eleventh avenue, New York. Catalogue, 10¾ x 15½ inches, 24 pages. Largely made up of views of plants in which the Paradigm skylights or glass side walls are used. It also contains description of the devices for securing the lights in place, the advantages of the Paradigm skylight, lists of users, text concerning the places where the system is particularly useful and why, and numerous testimonials.

Forgings.—Wyman & Gordon, Worcester, Mass. "A Short Story of Henry Maudsley." The latest in a series of biographies which have been issued by this company gives an interesting account of the man who is known as the originator of modern machine tools. It also describes the value of heat treatment of forgings, and shows by micro photographs the difference in structure before and after heat treatment.

Motor Cars.—Adams Company, Dubuque, Iowa. Illustrated catalogue of the Adams-Farwell motor car. Describes the furnishings, mechanism and operation of the car as a whole, followed by detailed information concerning the individual parts. This car is equipped with a special motor having three cylinders, radially disposed, which was described in *The Iron Age* of November 3, 1904.

Boring Mills.—Gisholt Machine Company, Madison, Wis. Illustrated catalogue of vertical and horizontal boring and turning mills. The introductory pages describe the mills and their parts, and succeeding facing pages contain half-tones and brief descriptions of the mills in various sizes and with special equipments, including 34-inch vertical mills with plain head and swivel head; 42-inch vertical mills with two swivel heads and one turret head; 52, 60, 64 and 72-inch vertical mills, horizontal mills, turret lathes and a tool grinder.

A Modern Cement Plant.—Dodge Mfg. Company, Mishawaka, Ind. Illustrated book 9 x 12 inches in size, 75 pages, entitled "The Construction of a Modern Cement Plant." Contains interesting information concerning cement and the process of its manufacture; suggestions as to the location and equipment of cement plants, and brief descriptions of a number of notable cement plants with views particularly selected to show power transmission systems. Other information of value concerns the packing and shipping of cement and cement formulæ. The latter part deals with the Dodge American system of rope transmission and component pieces of equipment, such as friction clutches, pulleys, pillow blocks, sheaves, couplings, &c.

Rolling Mill Machinery.—United Engineering & Foundry Company, Pittsburgh, Pa. Cloth bound illustrated catalogue, 8 x 10 inches, 205 pages. Contains an interesting introduction concerning the organization of the company, which is composed of the following departments: McGill & Co., Lincoln Foundry Company, Lloyd Booth Company, Chilled Roll Foundry Company and the Frank-Kneeland Machine Company, all in Pittsburgh. Views of the offices and about the works are given. The subject matter of the catalogue is classified under the headings: Lever shears, vertical shears, punches, rail straighteners, guillotine shears, tin plate squaring shears, tin plate doubling shears, hydraulic shears, hot and cold metal saws, roll turning lathes, hydraulic accumulators, hydraulic cranes, rolling mills, grinding mills, angle straightening machines, car squeezers and tube works machinery. Large half-tones illustrating various sizes and classes of the machines are profusely used.

House Tank Pumps.—Prindle Pump & Engineering Company, 95 Liberty street, New York. Catalogue A. Illustrated. Describes motor driven rotary pump sets and discusses their use, construction, operation and erection. It also describes an automatic tank switch for the control of the motor and lists the three sizes in which the pumps are made for direct current, single phase alternating, or two or three phase alternating current motor drive.

Induction Motors.—Emerson Electric Mfg. Company, St. Louis, Mo. Bulletin No. 3062. Contains an illustrated description of two types of automatic starting single phase alternating current induction motors of from 1-40 to 1-6 horse-power.

Worm Gearing.—Morse, Williams & Co., Philadelphia, Pa. Illustrated catalogue, 6 x 9 inches, 92 pages. Contains something historical concerning the Hindley worm gears and Hindley spirals, and the advantages which these concave worms have over straight worms. The catalogue is devoted to illustrations of gears of this character which the company has made for various work, notably for elevators, ship steering gears, anchor hoists, blooming mills, pumps, breech mechanisms of large guns, presses, mining machinery, &c. Tables of dimensions for various standard pitches are printed, with numbers by which they may be ordered.

Simplex Radial Drill Presses.—Dreses Machine Tool Company, Cincinnati, Ohio. Small illustrated catalogue. Contains views and specifications of 31, 36, 48 and 54 inch simplex radial drills, and illustrations of parts and accessories, including combination tilting table with worm movement, speed variator and constant speed and variable speed motor drives.

Preservative Paint.—Arlington Mfg. Company, Canton, Ohio. Three circulars. Dealing with carbonelastic coating, a protective paint for iron and steel work described as unaffected by sulphur, brine, acids, alkalies and climatic changes. One circular gives price-list and another shows a view of the new Williamsburg Bridge, New York City, on which the Arlington paint was used.

Fluorspar.—Geo. G. Blackwell, Sons & Co., Limited, The Albany, Liverpool, England. Folder. Concerns special facilities which this company has for supplying and shipping large quantities of fluorspar to all parts of the world. It contains a statement to the effect that this company is supplying at present some 30,000 tons annually.

Welding.—Standard Welding Company, Cleveland, Ohio. Circular. "Difficult Welds Made Easy." Mentions a number of unusual welding jobs which this company has undertaken.

Pumping Machinery.—Henry R. Worthington, 114 Liberty street, New York City. Illustrated catalogue, 6 x 9 inches, 132 pages. Describes many types of pumping, condensing and measuring devices developed by this company in the 64 years of its existence, the most prominent being the duplex steam pump of which Henry R. Worthington is the inventor. Special designs of this type of pump are adapted to boiler feeding, mine pumping, removing air and circulating water in condensers, water works service, fire service, &c. One illustration shows the interior of the Central Park avenue pumping station in Chicago, where three vertical triple expansion high duty quick acting engines are installed. One of these at its official trial gave a duty of 174,700,000 foot-pounds per 1000 pounds of superheated steam. Other apparatus described includes condensers, cooling towers, vacuum pumps, steam accumulators, feed water heaters, water meters and centrifugal pumps. An illustrated description of several of the last was given in *The Iron Age* of April 21, 1904..

Grinders and Polishing Machines.—Chas. H. Besly & Co., 15 South Clinton street, Chicago, Ill. Illustrated catalogue, 5½ x 9 inches, 56 pages. Contains a large amount of descriptive matter on the subject of grinding and polishing, with particular reference to the Gardner grinder and the use of spiral grooved steel disk wheels for the support of circles of emery cloth or paper. Instructive information in connection with work of this character is given. Illustrations show the many different types of the Gardner grinders, specifications being given with each. Other illustrations show samples of work and the manner of performing it. Band grinders and band polishing machines, on which emery paper or cloth is mounted upon the drum instead of a disk, are also illustrated, with specifications. The latter part of the catalogue contains miscellaneous matter such as Helmet babbitt and bronze spring wire, lathe dogs, clamps, oil cups, dies and die stocks and taps.

Oil Pumps.—Lunkenheimer Company, Cincinnati, Ohio. Pamphlet. Concerns mechanical oil pumps for steam engines, pumps, automobiles and traction engines.

Rock Drills.—Rand Drill Company, 128 Broadway, New York. Booklet. Describes Little Giant rock drills with tripod mounting and rock drills mounted on tunnel or drifting columns, with various other mountings for special work, such as the driving of narrow tunnels and the sinking of small shafts, quarry work, submarine drilling, subway construction, &c. Numerous interesting views are shown of work of these various characters in process. A few words are also given concerning compressors and pneumatic tools.

Cranes.—Northern Engineering Works, Detroit, Mich. Illustrated booklet No. 19. Shows a few of the many types of cranes which this company manufactures.

Match Box Machines.—Birch & Birch, Crawfordsville, Ind. Circular descriptive of a new improved tray or box making machine.

Wire Rope and Rope Clips.—A. Leschen & Sons Rope Company, St. Louis, Mo. Two circulars. One concerning iron and steel patent flattened strand wire rope and Hercules wire rope and the other the Atlas clip and stranded galvanized wire.

Adjustable Reamers.—Gisholt Machine Company, Madison, Wis. Loose leaf for insertion in binder. Concerns the solid adjustable reamer described in *The Iron Age* of September 29, 1904.

Galvanized Iron.—United Galvanizing Company, 525 North Front street, Philadelphia, Pa. Mailing card. Concerns the facilities of this company for the quick filling of orders for galvanized bars, angles, channels, tees, hoop and band iron, nails, spikes, plates, &c.

The National Electric Company, Milwaukee, Wis., has inaugurated a series of electrical catechisms which it is sending to the trade generally. These catechisms start with the first principles of electricity, giving the definitions of terms and their equivalents in better known mechanical apparatus wherever there is an equivalent.

Calendars.

The Watt Mining Car Wheel Company, Barnesville, Ohio. Hanger monthly calendar, 15 x 25 inches. Contains views of mine cars and installations where the cars are in use.

Becker-Brainard Milling Machine Company, Hyde Park, Mass. Hanger monthly calendar, 18½ x 24½ inches. Separate sheet for each month and large figures. Contains views of works and the various sizes and styles of milling machines manufactured. Also illustrates several special operations, cutters, work produced, and a grinder.

William Burg, 117 North Third street, St. Louis, Mo. Vest pocket leather bound memorandum book with renewable filler. Fly leaves contain a calendar and tables of useful information on the weights per unit of length of iron in various forms.

A Record Production of Pig Iron.

Stocks Decline 30,000 Tons.

We entered the new year with a record production of pig iron, the make in January having been, including an estimate of 20,000 tons for charcoal pig iron, very close to 1,800,000 gross tons. Barring accidents, February will do relatively better, since we entered the month with a capacity at work of 404,000 tons per week. Consumption is even greater, since stocks have again been drawn upon.

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Number of stacks.	February 1. Number in blast.	February 1. Capacity per week.	January 1. Number in blast.	January 1. Capacity per week.
New York:					
Buffalo dist.	10	8	13,313	8	14,453
Other New York	11	3	3,180	3	2,347
New Jersey	8	4	4,652	4	4,650
Spiegel	2	1	186	1	198
Pennsylvania:					
Lehigh Valley	27	18	10,920	16	10,275
Spiegel	2	2	390	1	239
Schuylkill Valley	13	9	10,162	9	10,240
Low. Susquehanna	10	5	6,218	5	6,488
Lebanon Valley	11	2	2,162	3	2,544
Spiegel	1	0	0	0	0
Pittsburgh dist.	39	37	100,700	36	95,000
Spiegel	4	4	3,942	3	1,962
Shenango Valley	21	17	32,210	17	31,820
West. Penn.	24	18	23,740	16	22,553
Spiegel	1	0	0	0	0
Maryland	5	3	6,036	3	6,097
Wheeling dist.	13	11	23,934	11	21,295
Ohio:					
Mahoning Valley	17	16	36,524	15	33,735
Central and Northern Ohio and Michigan	18	13	26,626	14	27,750
Hocking Valley	2	0	0	0	0
Hanging Rock	12	8	6,200	8	6,172
Illinois	21	16	35,100	12	27,400
Spiegel	1	1	700	0	0
Minnesota	1	1	1,203	1	1,215
Wisconsin	5	5	5,250	5	4,944
Missouri	1	1	1,000	1	950
Colorado	5	3	6,000	2	3,976
The South:					
Virginia	23	11	9,172	11	8,060
Kentucky	8	3	1,425	3	1,331
Alabama	44	24	26,276	23	25,463
Tennessee	16	12	6,430	11	5,858
Georgia	1	1	641	1	864
North Carolina	1	0	0	0	0
Totals	378	257	404,292	243	377,879

Monthly Pig Iron Production.

	September. (30 days)	October. (31 days)	November. (30 days)	December. (31 days)	January. (31 days)
New York	44,725	63,701	67,735	72,752	77,159
New Jersey	19,192	29,744	28,308	21,464	21,431
Lehigh Valley	33,166	37,270	39,069	44,581	53,207
Schuylkill Val.	27,055	29,081	39,165	45,335	44,956
Lower Susquehanna and Lebanon Val.	38,960	43,319	41,526	39,999	37,318
Pittsburgh dis.	395,324	402,880	382,316	412,433	461,362
Shenango Val.	92,273	100,557	106,326	131,417	144,278
West. Penn.	68,974	78,451	82,787	92,478	98,765
Md., Va. and Kentucky	48,200	44,547	51,499	66,105	72,495
Wheeling dis.	80,279	64,401	64,517	86,306	105,995
Mahoning Val.	104,724	109,918	129,774	149,397	161,462
Cent. and No. Hocking Valley and Hanging Rock	72,906	91,182	98,610	103,522	122,916
Ill., Mich., Minn., Wis., Mo. and Col.	21,449	22,406	24,295	27,336	27,730
Alabama	184,788	199,125	192,488	184,873	200,804
Tennessee, No. Carolina and Georgia	100,210	116,507	115,789	114,670	115,458
Totals	25,617	22,181	22,401	23,339	31,232
	1,357,842	1,455,270	1,486,605	1,616,007	1,776,568

We estimate the production of the anthracite and coke furnaces monthly as follows:

Production of Coke and Anthracite Pig.

	1903. Gross tons.	1904. Gross tons.	1905. Gross tons.
January (31 days)	1,472,788	923,651	1,776,568
February (29 days)	1,390,615	1,208,381	.....
March (31 days)	1,590,470	1,451,417	.....
April (30 days)	1,608,431	1,561,087	.....
May (31 days)	1,713,614	1,536,995	.....
June (30 days)	1,673,228	1,295,739	.....
July (31 days)	1,546,184	1,120,819	.....
August (31 days)	1,571,126	1,172,745	.....
September (30 days)	1,553,717	1,357,842	.....
October (31 days)	1,425,658	1,455,270	.....
November (30 days)	1,039,622	1,486,605	.....
December (31 days)	846,605	1,616,007	.....
Total year	17,432,058	16,186,558	.....

These figures do not include the production of charcoal iron. During the first half of 1904 the output was 213,356 gross tons, while during the second half it was only 124,173 tons, or at the rate of a little over 20,000 tons per month.

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Ashland, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of product month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production. 1903.	1904.	1905.	Spiegeleisen and ferromanganese. 1904.	1905.
January	.....	502,994	1,129,042	6,673	21,002
February	.....	756,260	.....	12,961	.....
March	.....	913,412	.....	23,128	.....
April	966,850	974,006	.....	29,145	.....
May	1,037,325	927,534	.....	25,755	.....
June	1,021,839	788,822	.....	24,950	.....
July	987,855	694,892	.....	27,284	.....
August	993,564	747,570	.....	19,280	.....
September	956,363	936,494	.....	20,723	.....
October	829,215	971,447	.....	13,669	.....
November	553,067	962,384	.....	13,442	.....
December	406,730	1,019,841	.....	13,325	.....

Deducting from the total monthly production the output of the steel companies we reach the following series of figures, which represent closely the make of the merchant furnaces. Taking into account the fluctuations in the stocks, we arrive at the apparent consumption from month to month:

Statistics of Merchant Furnaces—Gross Tons.

1904.	Production.	Stock.	Apparent consumption.
January	420,657	— 21,615	442,272
February	452,151	— 45,722	497,873
March	538,005	— 71,364	609,369
April	587,081	— 13,688	600,769
May	609,461	+ 101,433	508,028
June	506,917	+ 75,104	431,813
July	515,927	+ 49,960	465,967
August	425,175	— 39,743	464,918
September	421,348	— 73,883	495,231
October	483,823	— 26,656	510,479
November	524,221	— 70,198	594,419
December	596,400	— 55,760	652,200
Totals	6,081,166	.....	6,273,338
1905.			
January	647,526	— 30,724	678,250

This shows a current consumption of merchant iron of over 8,000,000 tons per annum.

Stocks.

Believing that a classification of the merchant stocks by general geographical divisions would aid in a correct appreciation of the situation, we have arranged them in three groups: The Eastern, which includes New York, New Jersey and the Schuylkill, Lehigh, Lower Susquehanna and Lebanon valleys; the Central Western and Northwestern, which includes western Pennsylvania, the Shenango and Mahoning valleys, the Hanging Rock region, central and northern Ohio, and Michigan, Illinois, Wisconsin, Minnesota and Missouri, and the Southern, which includes Virginia, Kentucky, North Carolina, Georgia, Alabama and Tennessee. The stocks, of course, do not include the holdings of the steel companies:

Merchant Furnace Stocks.

	Oct. 1.	Nov. 1.	Dec. 1.	Jan. 1.	Feb. 1.
East	96,397	88,980	88,142	84,967	85,054
Central and Northwest	269,047	247,769	210,080	174,729	155,770
South	190,003	192,284	160,572	143,338	131,486
Totals	555,447	529,033	458,794	403,034	372,310

An error was made in the January stocks, which has been revised.

For a series of months the active anthracite and coke furnace capacity fluctuated as follows:

	Coke capacity per week.		Coke capacity per week.
February 1, 1905	402,292	June 1	388,178
January 1	377,879	May 1	373,496
December 1, 1904	357,846	April 1	386,215
November 1	334,249	March 1	347,424
October 1	319,249	February 1	335,339
September 1	291,573	January 1, 1903	346,073
August 1	246,092	December 1, 1902	336,617
July 1	272,301	November 1	330,110
June 1	336,197	October 1	337,837
May 1	368,244	September 1	328,243
April 1	337,257	August 1	328,745
March 1	308,751	July 1	303,793
February 1	273,692	June 1	337,492
January 1, 1904	185,636	May 1	337,627
December 1, 1903	244,156	April 1	331,140
November 1	273,715	March 1	316,039
October 1	353,142	February 1	325,440
September 1	360,197	January 1, 1902	291,992
August 1	353,681	December 1, 1901	317,358
July 1	384,825		

During January there were blown in Durham, one Hokendauqua and one spiegel furnace in the Lehigh Valley; one Donora in the Pittsburgh district; Colonial and Scottdale in western Pennsylvania; one Joliet, one South Chicago and two Union furnaces of the Illinois Steel Company in the Chicago district; one Hubbard in the Mahoning Valley; Gem in Virginia; one Sloss and one Bessemer in Alabama, and Embree in Tennessee. There were blown out Lebanon Valley furnace, Allegheny in Virginia, and one Calumet in Illinois, which, however, is to go in again at once.

NEWS OF THE WORKS.

Iron and Steel.

The Berkshire Iron Company, which recently purchased the Sheridan Furnace, Sheridan, Pa., has increased its capital stock to $1,100,000.

Orders have been given to prepare for blast as soon as possible the five furnaces of the Lackawanna Iron & Steel Company in and about Lebanon, Pa., which have been idle for considerably over a year. The Colebrook furnaces will be started as soon as they are overhauled, which will take a short time, and will be followed by the Cornwall furnaces. S. S. Hartranft is manager of the furnaces.

The Hudson Iron Company, New York, will blow in its Hudson Furnace at Secaucus, N. J., about March 1.

Lebanon Valley Furnace, Lebanon, Pa., was blown out January 4 for repairs.

At the adjourned annual meeting of the stockholders of the Dillon-Griswold Wire Company, Sterling, Ill., the following officers and directors were elected: Chester Griswold, president and treasurer; John B. Howat, vice-president and general manager; Robert McCosh, secretary and assistant treasurer; Sanborn G. Tenney and W. M. Dillon.

Lawrence Furnace of the John Peters Iron Company, Ironton, Ohio, will be sold about March 14.

Calumet Furnace, South Chicago, Ill., will be blown in within a few days.

Everett Furnace, Everett, Pa., which is operated by Joseph E. Thropp, made during the month of January a daily average of 199 tons of iron, which is the best work the furnace ever did. In three days in the last week of January it produced 704 gross tons, and since blowing in last June the stack has made a daily average of 187 tons. G. W. Hughes is superintendent of the furnace.

The British Columbia Nail & Wire Company, Limited, Vancouver, B. C., is in the market for equipment for a wire nail mill, including drawing benches and nail machines, second-hand preferred.

The Diamond State Steel Company, Wilmington, Del., has received permission from the court to dispose of its manufactured products and to make up raw material stored at the plant. This will enable the company to start up its plant in a limited way.

Some excellent records for production are being made at the Ohio Works of the Carnegie Steel Company, at Youngstown, Ohio. Recently a run of 583 ingots was made in 12 hours. Thomas McDonald is general superintendent of these works.

The Wheeling Steel & Iron Company, Wheeling, W. Va., has decided to remodel its skelp mill to permit of rolling wider sizes and for this purpose has placed a contract with Mackintosh, Hemphill & Co., Pittsburgh, for taking out the present engine which drives its skelp mill and installing a new Corliss engine, 44 x 66 inch stroke. This engine will be coupled direct to the roughing train of the mill and will be arranged to drive the finishing train by means of ropes.

A deed has been recorded at Lebanon, Pa., by which the Pennsylvania Steel Company secures from Mrs. Euphemia Grubb de Cerkey two ninety-sixth shares in the Cornwall ore banks, near Lebanon, Pa. The value stated in the papers recorded is $20,000. Mrs. de Cerkey is a daughter of Edward B. Grubb, noted as the owner of a large part of the famous ore hills. The Pennsylvania Steel Company already holds a considerable share in the ore hills.

The Meyersdale Sheet Steel Company, which has been erecting a sheet plant at Meyersdale, Pa., will have the mills completed and ready for operation within 30 days. The plant contains two 24-inch hot mills and one 20-inch cold mill, and the product will be black plate and planished steel sheets, gauges 18 to 30. A. F. Baumgarten & Bro. of Pittsburgh will direct the sales and purchases of the plant.

The American Sheet & Tin Plate Company is preparing plans for enlarging the tin plate mill at Sharon, Pa. It is at this plant that the Bray continuous process of rolling sheets or tin plate is being installed.

The 11 open hearth furnaces in the South Sharon Works of the Carnegie Steel Company, at South Sharon, Pa., turned out 35,711 gross tons of open hearth steel in 148 heats in January, surpassing the best previous output for one month by 3457 tons.

The Oliver Iron & Steel Company, Pittsburgh, recently secured a very large order for 1½-inch bolts for shipment to Porto Rico. A special nut machine of English design is being installed in this plant, which will considerably increase the output of nuts.

The Youngstown Mfg. Company, Youngstown, Ohio, has filed articles of dissolution. The company formerly made iron and steel bars, nuts and bolts, but has not operated its plant for a long time.

General Machinery.

Adam's Steel & Wire Works, Joliet, Ill., is arranging for the manufacture of a new steel metal specialty, to which will probably be devoted considerable time and energy in the near future. The company expects to be in the market for machinery for the welding of large size wrought iron pipe.

The Alpena branch of the Sanilac Center Mfg. Company, Limited, Sanilac, Mich., will erect a building and install an engine, corrugating machine, shears, drills and punches and such other appliances as may be necessary in making corrugated galvanized culverts and other sheet steel specialties.

The Armstrong Brothers Tool Company, Chicago, is putting up a new plant of brick and mill construction. The main building will be 60 x 175 feet, three stories and basement, with an extension to the first floor of 30 feet. The plant will be equipped with a complete line of shafting, hangers, &c. It is yet undecided whether to utilize steam for power or to install motors and purchase power. The plant site is 197 feet on the Northwestern Railway tracks, affording excellent shipping facilities, and 203 feet on San Francisco avenue.

The Indianapolis Drop Forging Company, Indianapolis, Ind., whose plant was entirely destroyed by fire last July, has now completed its new works on the site of the old, consisting of main building 50 x 250 feet, and an addition 55 x 150 feet, all of brick and stone. These buildings have been newly equipped with all the latest improved machinery adapted for the production of drop forgings, including the company's specialties, engineers' and agricultural screw wrenches, and the plant is one of the largest in the West. With the new equipment, which was started up on December 26, and the close proximity of the works to the leading lines of railroad, the company is now in position to take care of all orders promptly.

The Landis Machine Company, Waynesboro, Pa., is now shipping its 2-inch bolt cutters in single, double and triple heads, as well as the smaller sizes, and has orders booked to keep the plant engaged for four months. The company has shipped quite a number of machines to England and the Continent of Europe.

The Bessemer Foundry & Machine Company, Pittsburgh, has been granted a Delaware charter with a capital of $50,000. The incorporators are James K. Neagley, D. B. Neagley and L. E. McKain, all of Pittsburgh. The new company is formed for the purpose of doing a general machine and foundry business, but plans have not yet been worked out. It is probable a large plant will be built in the Pittsburgh district.

The Larzelere Machine Company, Williamsport, Pa., builder of engines, boilers and saw mills, has sold the buildings and ground occupied by its plant. As soon as a new site can be arranged for the company will install its machinery and continue its business.

The Buffalo Forge Company, Buffalo, N. Y., has recently obtained the following contracts: Buckeye Pipe Line Company, Montpelier, Ind., induced draft outfit, consisting of large duplex fans, with direct attached engines; Public School 146, heating and ventilating equipment; State Insane Asylum, North Gradton, Mass., heating and ventilating equipment; Humbolt roundhouse of Canadian Northern Railroad, heating equipment; Trenton, N. J., shops, Pennsylvania Railroad, forge shop equipment

Himeji Electric Light Company, Japan, large tandem compound engine.

The Buffalo Steam Pump Company, Buffalo, N. Y., which is controlled by the Buffalo Forge Company, has received an order to build a fire pump for the League Island Navy Yard; duplex horizontal electrically driven power pump for the Schlitz Brewing Company, Milwaukee, Wis., and a number of pumps of various sizes for the different plants of the International Salt Company. The company also has a number of orders on its books for shipment to London, Rio de Janeiro and Australia.

The Geo. L. Squier Mfg. Company, Buffalo, N. Y., which is another interest of the Buffalo Forge Company, is shipping a complete cocoa drying outfit to Africa, a five-roll cane mill of the largest size to Africa, and a large sugar machinery outfit to Brazil.

Mackintosh, Hemphill & Co., Pittsburgh, builders of engines and heavy rolling mill machinery of all kinds, have secured a contract from the Portsmouth Steel Company, Portsmouth, Ohio, for a 30 x 84 inch three-high plate mill with tables. The mill is being designed especially for rolling light plates, and the housings will be steel castings, in accordance with the latest plate mill practice. The engine to drive this mill will also be furnished by Mackintosh, Hemphill & Co., and will be of the Corliss type, 44 x 60 inches, with fly wheel 24 feet in diameter, weighing 50 tons.

The Geometric Drill Company, New Haven, Conn., being organized under a charter granted by the State of Delaware which was limited in its duration, decided to reorganize as a Connecticut corporation under the name of the Geometric Tool Company, with a capital stock of $100,000, under an arrangement whereby the stock of the new company was to be issued for the property of the old and the stockholders of the old company were to receive stock of the new company in proportion to their respective holdings. The laws of Connecticut are very favorable to the management of such corporations, there being no annual franchise tax, and as the stockholders were mostly resident in and about New Haven it was considered much more convenient as well as economical to have the corporation located there. The transfer has already been made, the new company assuming the obligations of the old. The balance sheet shows an actual valuation of property in excess of the amount for which the new company is capitalized.

Power Plant Equipment.

The city of McKinney, Texas, will install a complete electric light system. Everything will be purchased new except the engines. Jesse Shain, J. D. Bass and Giles L. McKinney are the committee chosen to contract for all material for the entire plant.

The construction of a lighting and ice plant has been started at Clyde, Kan. Two 30-kw. generators, one 50-kw. alternator, two compressors and a 10-ton ice machine will be installed. M. E. Maggart is owner and operator of the new plant.

Edwin B. Hendin, Denver, Col., has been awarded the contract for supplying an 80 horse-power tubular boiler and a 27,000-gallon steel receiving tank at Fort Logan, Col., his bid being $3807.38.

E. H. Abadir & Co., St. Louis, Mo., have the contract for the installation of a 350 horse-power boiler and equipment at the electric light plant at Little Rock, Ark.

The Peter Schoenhofen Brewing Company, Chicago, is erecting a three-story engine and condenser house, which will be 56 x 60 feet. A 300-ton refrigerating machine has been purchased from the Fred W. Wolf Company, Chicago, and the brewing company yet requires two 250-kw. generators. Mr. Sippie has these matters in charge.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., has sold to the La Belle Iron Works, Steubenville, Ohio, a direct current engine type generator, to be rated at 1000 kw., the voltage to be 250, with switchboard. The Westinghouse apparatus already installed in this plant includes alternating and direct current generators with a total rated capacity of 1250 kw., a 300-kw. rotary converter and over 200 motors, not including those used on the cranes, ranging in size from 1 to 200 horse-power.

The Alaska Fuel, Power & Transportation Company has been organized with a capital stock of $1,000,000 by parties interested in the Council City and Salmon River Railroad, Alaska, to acquire the coal deposits in the Seward Peninsula, Alaska, and to develop electricity to furnish power for the various mines and camps. No machinery or supplies will be purchased this year. W. H. Duval, of Duval & Cone, 76 Worth street, New York, is interested.

Foundries.

The Youngstown Car Mfg. Company, Frick Building, Pittsburgh, with a plant at Youngstown, Ohio, has added a foundry to its car wheel works for the manufacture of car wheels for industrial and mine cars. The company will also make a special self oiling wheel, patent anti friction end thrust. R. W. Oswald formerly of the Carlin Machinery & Supply Company, Incorporated, Allegheny, Pa., will have charge of this department.

Foundry equipment is required by the Eureka Stove Works, Birmingham, Ala., which was recently incorporated with a capital stock of $50,000 and which has taken over the plant of the Eureka Foundry & Machine Company. A new brick and iron foundry building, 80 x 102 feet, is to be erected at a cost of $3000, and a new office building, 25 x 40 feet, is to be constructed. John McLean is president; John C. McLean, vice-president, and E. E. Howard, secretary and treasurer.

The receivers of the Delaware Steel Castings Company, Chester, Pa., will sell the plant at auction on February 16. The plant, which was only recently erected and equipped, consists of a foundry building, 127 x 500 feet; gas producer house, 30 x 60 feet; engine and boiler house, 30 x 80 feet, and office building, 20 x 40 feet. It is equipped with an annealing furnace, five gas producers, 225 horse-power Corliss engine, 250 horse-power Berry boiler, Crocker-Wheeler generator, 225 horse-power electric motors, grinders, saws, shapers and other machinery necessary to a complete steel casting plant.

Walter H. Storm & Co., Incorporated, 26 Cortlandt street, New York, has incorporated to make structural and machinery castings. The company has taken over a modernly equipped plant with a daily capacity of 40 tons, and makes a specialty of stair castings, for which it has a large contract from the iron trade of this city. Walter H. Storm is president and manager.

H. W. Caldwell & Son Company, makers of elevating, conveying and power transmission machinery, Chicago, will erect a new foundry building, 115 x 200 feet. Brick and steel will be used in its construction. Details will be available in about 30 days.

The Western Foundry Company, Chicago, is erecting a one-story mill room, 70 x 100 feet. It is of brick and mill construction.

The Union Car Wheel Company, Pittsburgh, has applied for a Delaware charter to manufacture iron, steel or any other metal, the capital stock to be $150,000. The incorporators are G. E. Reynolds, C. L. Kerr and Frank V. Eaton, all of Pittsburgh.

The Newport Iron & Brass Foundry Company, Newport, Ky., which was recently organized, has purchased the plant and business of the Newport Foundry & Machine Company.

Bridges and Buildings.

The annual meeting of stockholders of the West Virginia Bridge & Construction Company was held last week in Wheeling, W. Va. The following directors were elected: Senator Stephen B. Elkins, Edward Hazlett, W. E. Stone, J. J. Holloway, C. R. Hubbard, E. W. Ogelbay, Charles F. Paxton, W. A. Wilson, George A. Laughlin. Mr. Wilson is the only new member of the board, and succeeds J. H. Barrett, formerly general manager, who recently resigned.

The McClintic-Marshall Construction Company, with works at Pittsburgh and Pottstown, Pa., builder of steel bridges, steel buildings and heavy structural work, has recently secured some large contracts. Among these are 4000 tons of bridge work and track elevation for the Chicago and Western Indiana district and 1500 tons of building material for the Pennsylvania Company; also a large steel building for the St. Louis Plate Glass Company, to replace furnace building, casting hall and lehr building, which were of wooden construction and which were recently destroyed by fire. The steel building to replace these wooden structures will contain 50,000 square feet. Also a steel building 50 x 360 feet in size, to contain the rail finishing mill, for the Republic Iron & Steel Company at Youngstown, Ohio. Also steel frame work for the Renova shops of the Pennsylvania Railroad, amounting to 500 tons, and a steel building, 80 x 200 feet, for the Youngstown Car & Mfg. Company, to contain a new foundry being built at Youngstown, Ohio.

Fires.

Fire destroyed the plant of the Worcester Builders' Finishing Company, Worcester, Mass., February 1, with a loss of $8000

The three-story brick machine shop of Swift & Co., Chicago, Ill., was recently damaged $5000 by fire.

The foundry of John H. Dialogue & Son, Camden, N. J., was recently damaged $5000 by fire.

The Excelsior Rolling Mills, Marysville, Kan., were destroyed by fire February 2. The loss is placed at $150,000.

Fire on February 3 caused a loss of $8000 at the plant of the Cramp Shipbuilding Company, Philadelphia.

The plant of the Victor Talking Machine Company, Camden, N. J., was recently damaged $7500 by fire.

The machine shop of G. & J. Reisech, Pittsburgh, Pa., was destroyed by fire last week. The loss is estimated at about $25,000.

Hardware.

The Standard Emery & Polishing Wheel Company, Springfield, Mass., has removed from Brightwood to 48-50 Taylor street, where five times the former manufacturing space is available. The company is the originator and sole manufacturer of a patent paper polishing wheel, and also manufactures laminated and other felt wheels, solid leather wheels and canvas wheels.

The Black Silk Stove Polish Works, Sterling, Ill., is erecting a new factory building, 28 x 120 feet, two stories high. This new building will greatly enlarge the manufacturing capacity of the company.

The Hawkeye Pump Company, Washington, Iowa, is making a number of improvements in plant to meet the increasing demand for the Hawkeye galvanized steel cistern, house and stock well pumps.

Gibbs Automatic Sash Lock Company, Lexington, Ky., is now installing machinery in a two-story brick building, 80 x 130 feet, the greater portion of which will be occupied by the company. The factory will, it is expected, be in operation within three weeks, with a capacity of several thousand sash locks a day.

In the near future the erection of an important addition to the foundry of the Phillips & Buttorff Mfg. Company, Nashville, Tenn., will be begun. The company, which last year made two additions to its foundry, will materially enlarge its mounting department. The company manufactures stoves, hollow ware, tinware, mantels and grates, lamp goods, toys, &c.

Miscellaneous.

The Logansport & Wabash Valley Gas Company, Logansport, Ind., contemplates the erection of a large fuel gas plant. C. F. Dieterich, New York, is president of the company and James Murdock, Lafayette, Ind., one of the largest stockholders.

The City Gas & Electric Company, Paris, Ill., has increased its capital stock $60,000 in order to get money to improve the plant.

The Wabash-Pittsburgh Terminal Railroad, controlled by the Pittsburgh Coal Company, Pittsburgh, Pa., is making inquiries for 1500 to 2500 steel gondola cars.

The Anniston, Ala., plant of the Western Car Wheel & Foundry Company, which has been idle for a long time, is being started into operation. The plant has a capacity of 10 or 15 cars a day, and the company has sufficient orders on its books to keep it in operation at full capacity for a long time. Arrangements are being made for drawing the pig iron supplies for this plant from Birmingham furnaces.

The Kiler Motor Pump & Supply Company has been incorporated at Indianapolis, Ind., with $50,000 capital stock, by Chas. M. Kiler, Alexander Marley, H. C. Randolph and J. T. Fell.

The Denio General Electric Company, Rochester, N. Y., was recently incorporated to manufacture telephone, telegraph and other electric appliances. For the present the company will devote itself to the production of a new patented automatic fire alarm. It has not yet been decided whether a factory will be installed or whether the appliances will be made by contract.

Stephano Brothers, Philadelphia, Pa., manufacturers of Egyptian cigarettes, will not require any machinery for their proposed new plant except elevators and a pump. The firm is to erect a building 44 x 177 feet, seven stories high.

The Wheelan Company, Red Bank, N. J., has been incorporated to manufacture the Preston device for automatically replacing the trolley upon the wire. It has not yet been decided whether to erect a plant or have the device made by contract. William A. Hopping is president; Hobert T. Preston, secretary, and George C. Hopping, treasurer.

The W. A. Bates Mfg. Company, Cuba, N. Y., has been incorporated to manufacture sheet metal devices. Capital, $2000. Incorporators: W. A. Bates, L. Bates and Jno. Stevens.

Ornamental iron seats are to be placed in Cincinnati's parks. Council has been asked for authority to issue $1500 worth of bonds for the purchase of 300 benches.

The American Radiator Company is erecting a large warehouse on Somers street, Cincinnati, to cost about $40,000. The company expects to make that city a distributing center for the West and will carry an immense stock on hand.

The Republic Iron & Steel Company will build 400 coke ovens near the Orient Coke Works, south of Uniontown, Pa. The company has 1200 acres of coal lands and the new ovens will furnish coke for the blast furnaces at Youngstown and New Castle.

The Energy Elevator Company, Philadelphia, has taken contracts for a freight lift to be installed in the State College, Bellefonte, Pa.; a large lift for Merion parties, and orders have been received from Goldsboro, N. C., and Chattsworth, Ill. Local deliveries include a 3-ton power elevator at 3012 Market street, and an electric freight elevator at 234 Queen street. Hand power freight lifts are also to be installed in the new addition to the First Regiment, N. G. P. Armory.

The Indiana Steel Corporation has been incorporated at South Bend, Ind., with $40,000 capital stock, by Walter E. Mack, John E. Wilcoxen and Wm. Mack.

The Pittsburgh Oil & Gas Company has just completed its gas main from the gas fields in Clarion County, Pa., to Ashtabula, Ohio. It consists of 8 and 10 inch pipe, and from the starting point in the Speechley gas fields to its terminus has branches extending to and will supply gas to Jamestown, Greenville, Fredonia and Stoneboro, Pa., and Andover, Jefferson, Conneaut and Ashtabula, Ohio. The gas was turned into the line last week and big pumps started to force it to the points of consumption. With the installation of the new line more than 9000 consumers will be added to those supplied by the company. During the coming summer many other smaller towns in Pennsylvania and Northeastern Ohio will be supplied with gas from the Clarion County fields.

Steps have been taken at Carlisle, Pa., for the rebuilding of the Carlisle Body & Gear Works, burned a short time ago.

The J. D. Connell Iron Works Company, New Orleans, La., has secured a very desirable piece of land on the New Basin Canal, upon which it is proposed to erect a plant for the construction of vessels and the building of engines and boilers. A full equipment of the necessary machinery will shortly be installed, the purchase of which has already been made.

The New York City Milling Company, Produce Exchange, New York, is to build a five-story brick mill, 100 x 132 feet.

The Delaware Metal Refinery, Philadelphia, Pa., is preparing to rebuild along original lines its works, which were recently damaged by fire. The furnaces were only slightly damaged and only require repairs, and there will be very little machinery to renew.

J. Murray Mitchell has been appointed receiver for the Coughlin-Sanford Switch Company, New York.

Lamb & Ritchie, Cambridge, Mass., have sold 57,000 square feet of land at Cambridgeport, containing a brick factory building, to the National Biscuit Company, which will build a modern factory on the site. The building was formerly occupied by Lamb & Ritchie for their lead lined iron pipe department, which they sold out last spring to the Lead Lined Pipe Company, Wakefield, Mass.

The business of Hale Brothers, 42 Lagrange street, Worcester, Mass., manufacturers of jack chains, has been incorporated as the Hale Brothers Company under Massachusetts laws, with capital stock of $5000. The officers are Lydia A. Brimmer, president; Olive M. Bowman, treasurer, and Mitchell Freeman, clerk, all of Boston. It is an old business and will be conducted without change in management.

The business of the Union Stove Lining Company, Taunton, Mass., has been incorporated under Massachusetts laws with capital stock of $10,000. The officers are Enoch N. Goff, Taunton, president; Charles H. Lincoln, Taunton, treasurer, and Ralph I. Durkee, Somerville, clerk.

Richards & Co., Incorporated, Boston, Mass., dealer in metal, has removed its warehouse and office from 60 Union street to much larger quarters, 200-206 Causeway street and 117-125 Beverly street, next to the North Terminal Station.

The Temiskaming & Northern Ontario Railroad, now in course of construction, writes that its requirements in rails this year will be about 15,000 tons, of which 7000 tons are now under order with the Soo works.

The general offices of the Bessemer Coal & Coke Company will be moved from Cleveland to Pittsburgh on April 1. This decision was arrived at at a meeting of the stockholders held in Pittsburgh last week, at which the following officers were elected: C. J. Brokenshire, Cleveland, president; George H. Love, Johnstown, vice-president; E. M. Love, Johnstown, secretary, and J. R. Branch, New York, treasurer. The directors are F. W. Wood, Cleveland; L. F. Demmler, Pittsburgh; J. C. Lang, Pittsburgh; William Steinmeyer, Pittsburgh; E. H. Baker, Cleveland; Wilford Johnston, New York.

The Western Electric Company, New York, has secured an option on 34 acres of ground near McKeesport, Pa., and will possibly build a plant on this ground, but definite plans have not yet been made.

The Mahoning Foundry & Machine Company.—This company, whose plant is located at Youngstown, Ohio, is adding a 108 x 120 inch x 18 foot planer to its machine shop equipment. It has recently contracted to furnish the Youngstown Iron & Steel Roofing Company a Danielson No. 206 C power press to be used in the manufacture of whiffletrees and other sheet metal specialties; also an additional 26-inch sheet mill, including sheet and pair furnace castings. The Mahoning Company also has a contract with the Morgan Engineering Company, Alliance, Ohio, for castings required on a 500-ton hydraulic press and eight steam hammers. This company recently completed a large casting order for the Morgan Engineering Company, covering castings for large plate mill shears, several of which were from 25 to 30 tons in weight. It also manufactures caustic soda pots for the large chemical manufacturing companies, upon which it is booked one year ahead, and Slick-Morrison cast iron ladle thimbles for use in blast furnace slag cars. The business outlook is reported very encouraging.

Recently the Shenango Works of the Carnegie Steel Company, at New Castle, Pa., turned out 1243 gross tons of sheet and tin bars in 12 hours. During January this plant made 48,500 tons of Bessemer ingots.

Core Sand Binders.*

I believe that I can show good cause for the title "Core Sand Binders"—show that these words are better and that we should drop the use of the expression "core compound" as the general name for the materials that are used in sticking core sand together. It is true that every material used for this purpose is a compound. But so is the sand a compound. So is the pig iron a compound, though certainly no salesman has yet had the nerve to offer you any Carnegie chill casting compound under the impression that you would recognize it as pig iron.

The materials in question are employed solely for their adhesive qualities. You may say that they do other things, but be that as it may, the basic reason for their use is to bind the sand together so that it will take and hold the desired shape. Certainly such a material is a sand binder, and when used for cores a core sand binder. This is my plea and I hope my justification for the new name.

The Core Shop Suffering from Neglect.

It has been brought forcibly home to me again and again as I travel from foundry to foundry that the core shop has suffered and is suffering from neglect. I believe that I am perfectly safe in saying that in addressing the Foundrymen's Association of the Pittsburgh district I am addressing men who have made a closer study of the business than any other such body in the United States, and yet I doubt if there are five of you who can tell what your binders cost per ton of sand mixed; not half who can tell off hand, with any accuracy, what your core sand mixtures are, and I will warrant if there are any who think they know that one visit to their core room will prove they are in error.

Here is a trade without a literature. Can you expect progress from a nation without a written language? In what is probably the most read book of the few relating to the foundry trade there are just 4½ pages devoted to core making out of nearly 400, and one-half of these 4½ pages is padding.

The Coremaker Difficult to Teach.

This neglect has brought about another condition of affairs. The sand, the binders and the manner of drying have been worked out for each foundry, and the coremaker that lasted long enough to get good results has held the job until he and not the office was tired. This fact has made him narrow, localized and with a high opinion of his own skill in sands and binders and therefore difficult to teach.

As an example of this, and also of several other related points, I recollect meeting a boss coremaker a short time ago who was dissatisfied with the results he was having. This in itself was remarkable, and especially so because in my business of selling a core sand binder I had just left the office of the company he was working for, where I had been told that they could not even listen to my story because they were getting good results from their cores and there was no use in disturbing any part of the plant that was running smoothly and well.

It turned out that this man had been working for a rival concern, located a few miles away, and because of his good results had received and accepted an offer from his present employer, who at the time was having trouble from excessive breakage of cores, much blown work and many condemned castings, owing to defects in the cored work.

Now he had used my binder in the old shop and I was of course curious to know why I had lost his trade and anxious to secure it again. I knew something of the sands in that locality, and after an examination of those he was using I worked out the following story: The figures that I now give are not the actual ones, but are relatively correct. The sand mixture in his old shop was:

30 per cent. old or gangway sand	$0.00
30 per cent. loamy sand, at $1.80 per ton	.54
40 per cent. local bank sand, at 75 cents per ton	.30
Total	$0.84

1 part of Gluetrin to 40 parts of sand.

This binder cost 15 cents per gallon, or 3¾ cents per quart, delivered. The sand ran 900 quarts to the ton, and on these figures the binder cost 84 cents per ton of sand mixed, and the total cost for each ton of core sand ready for cores was $1.68. The new shop had been using:

40 per cent. sharp sand, at $1.20 per ton	$0.48
60 per cent. loamy sand, at $1.80 per ton	1.08
Total	$1.56

1 part of flour to 12 parts of sand.

Flour at that time cost $25 a ton, and on a weight of 1.1 pounds to the quart the cost of binder per ton of core sand mixed was $1.03, and the total cost for each ton of core sand ready for cores was $2.59 per ton. The work from these cores was bad. They had tried rosin, on and off, with equally poor results.

With these two sands, which were different from the loamy sands of his old shop, this man tried, with and without old sand, Gluetrin, as he had used it before, and failed. He then went back to the original practice of this shop, flour, and by changing the mixture slightly and seeing that the proportions of the sands and the sands to the flour did not vary, and forbidding the coremakers to run to the flour sack whenever they liked, which had previously been allowed, he managed to get much better results than they had formerly secured. This satisfied the office, but the work was not as good as in the old shop. He knew it and was dissatisfied, but apparently helpless. Here was a man that looked ready for my material, and in spite of his failures was easily persuaded to try it again. I was certain after examining his sands that the whole trouble was in the sand mixture, and several were tried, this being finally adopted as the most satisfactory and economical:

40 per cent old or gangway sand	$0.00
40 per cent. loamy sand, at $1.80 per ton	.72
20 per cent. local bank sand, at 75 cents per ton	.15
Total	$0.87

1 part of Gluetrin, at 3¾ cents a quart, to 50 parts of sand cost 67½ cents per ton of sand mixed, and the total cost for each ton of core sand, ready for cores, was $1.54½.

This was successful, reduced the breakage of cores and did away entirely with any blown castings or trouble from the size of cored holes, besides making a clear saving of $1.04½ on each ton of core sand mixed.

It seems to me that there were two causes at work here. The one that his superiors did not know enough to push him for better results, nor to aid him with suggestions, and the other that he himself lacked sand experience, did not realize that even though sands look alike, they may be different, and that one or two trials are not sufficient to test a sand or a binder. Incidentally he learned how to figure the cost of his mixture, something he had never done before.

Kinds of Core Sand Binders.

Under this heading of core sand binders any material possessing adhesive qualities might be included. Local conditions and sands have caused the use of some that seem absurd to the general trade. A consideration of these freaks is omitted and only those that are found in general use are considered. These are:

Solids.	Liquids.
1. Dextrine.	1. Fish oil.
2. Flour.	2. Glue.
3. Proprietary dry mixtures.	3. Gluetrin (proprietary liquid).
4. Rosin.	4. Linseed oil.
	5. Molasses.
	6. Proprietary oil mixtures.
	7. Rosin oil.

At the first glance it is seen that these can be divided into two distinct classes—the solids and the liquids. It is to the difference in action of these two conditions of matter when used as core sand binders that I wish especially to call your attention, and not to the merits or demerits of any particular one.

Let us consider the work that is required of a binder. The local conditions in each shop vary greatly, and it is only possible to name these requirements in a general way. A good binder must make a core that 1, Is strong both green and dry; 2, is weak and rotten after the casting is cooled; 3, is not easily affected by moisture; 4, will give off but little gas; 5, will dry quickly; 6, will not change in size; 7, has a low cost.

The ideally perfect core sand binder is one that mixes easily with the sand, making a mass that packs with but little work in the box, leaves it freely and leaves it clean: is strong enough before baking to stand alone

* Paper read by J. S. Robeson, president of the American Glutrose Company, Philadelphia, before the Pittsburgh Foundrymen's Association, February 6, 1905.

without sagging or deformation and retain sharp edges. Such a core must now bake in the shortest possible time, and when baked be hard enough to stand rough handling, be weak enough to yield to the contraction of the iron in cooling, porous enough to permit the gases to escape freely, and after cooling leave the casting easily and cleanly.

The usual method of preparing the mixture is to put on the floor the required quantity of each kind of sand, previously selected by the foreman or boss coremaker, and to spread or sprinkle on top of this pile the necessary amount of the dry or liquid binder that is to be used, afterward wetting the mass, as may be required, with water. This pile is then cut over and shoveled, being finally put through a riddle and then delivered to the coremakers or put in a pile ready for their use. There are various modifications of this practice in the way of riddling the sand before the binder is put on, mixing in a machine, &c. Every step that is taken to increase the thoroughness of the mixing is a step taken in advance. The more perfect the mixture the better the core.

If you are using a dry binder—flour, for example—and it is simply dumped on the pile of sand, wet down and put into barrows, wheeled to the coremaker and made up into cores, you will have a core that consists of a gob of flour with a little sand in it next to a gob of sand with a little flour in it. It does not take a very wise man to know that such a core will be weak, and it is a fair presumption that when the hot metal strikes one such loaf of bread in the core there will be a large volume of gas given off at that point and a resultant blown casting.

The more thoroughly the sand and binder are stirred and mixed together the more even will the distribution be and the more nearly will the ideal condition be reached of having each grain of sand surrounded and attached to the next grain by the binder. For this reason dry binders should be very finely ground—be very much finer than the sand.

This condition of fineness is true of flour, not quite so true of rosin, and not nearly so much so of the dry binder mixtures on the market. Flour is delivered in a much more finely ground condition than any particle of ordinary sand and if kept dry will remain loose and free from lumps. Rosin is not usually—in fact, I think, never—so finely ground, but even so will immediately, because of the moisture and heat in the air under normal conditions, commence to stick together and ball up. All the dry mixtures sold will act the same way as rosin, in varying degrees, so that the result with these two latter materials is that, however much labor may be spent on the mixing, the mass will never be nearly so uniform as with flour. If flour is therefore the best, let us see how bad it is.

The sand is composed of grains varying in size from particles as small as a needle point up to ¼ inch. The variation in the shape of these grains is much greater than in the size, and in fact the shapes met with are so various that they cannot be numbered. This matter of shape, as long as the size is within the limits already mentioned, is the most important. Roughly speaking, these grains may be divided into two kinds—namely, those that are angular, having sharp corners and numberless projections and recesses, and those that are rounded, the projections having been rubbed off, so that the grain is a more or less true sphere with a highly polished surface.

Difference in Sand Structure.

Some years ago I was engaged in the manufacture of steel by the basic Bessemer process, and as part of our practice it was necessary for us to make dolomite bricks. For this purpose we used an exceptionally pure dolomitic limestone, which was crushed in a jaw crusher, then pulverized to nearly the fineness of flour, dampened with water and pressed into building brick form and size on an ordinary brick press, then calcined at a very high temperature. The work of making these bricks was progressing very satisfactorily, the breakage in handling from the brick press and in piling in the kilns being practically nothing, when there was offered to us a limestone from another quarry.

Repeated careful chemical analyses of this stone showed that it differed but little from that we were using. If anything, it was more nearly pure and a contract was placed for a large tonnage. Shipments arrived and were dumped and used indiscriminately with the older stone. Later investigation showed that they were probably in about equal proportions in the stock pile, so that the pulverized material coming to the brick press was about half and half of each stone. With its use trouble immediately resulted. The bricks were very weak as they came from the press. Fully 25 per cent. were broken in the handling at this point, and from 10 to 15 per cent. more when piling in the oven.

Various means, such as increasing the water, the pressure on the press, &c., were tried, but with no success in doing away with the trouble. Instant relief was necessary, so that the use of the new stone was stopped, with an immediate stoppage of the trouble, while the investigation proceeded. The microscope finally told the story, as it showed that the older stone crushed and pulverized into granular grains, while the newer stone gave almost perfectly rounded particles. The geological explanation carried this back to the manner of the original deposition or formation. It can easily be realized that under pressure these granular pieces would knit into one another, projection into recess, so that their very shape made a strong bond, whereas the rounded grains could simply have their polished curves the one against the other, without bond, and, in fact, of a position and of a shape to encourage a sliding or rolling action and consequent weakness and breakage.

This same story is exactly and similarly true of the core sand. The bond is increased in the cores, however, by the use of some added material, that by the aid of water or of heat becomes adhesive or is so of itself. This, however, is but an aid. It does not change the conditions produced by the first shape of the sand grains. The more angular they are the less work the added adhesive has to do; the more rounded, the greater the work. There is a common expression used in the foundry, that a sand is sharp, and, on examination, I have found that such a sand invariably shows the angular grains to which I have referred.

I have not come across, however, any expression or word or name that denoted the reverse of this condition, the nonsharp kind. All of the nonsharp kind that I have used contained some loam or clay; so that, for want of a better name, I have called this loamy sand. Now I do not know whether it is true or not that these rounded grains only occur with the loam admixture. It is my experience, however, that the two always appear together, and when they do so appear, that the loam acts as a binder. Thus the two kinds of sand, the sharp sand and the loamy sand, are both, in a measure, self binding, though from entirely different causes, and the bond, as formed, is of a different nature.

I have never found a case where what might be termed the angular bond was strong enough to make a core without an added binder, but I know of one loamy sand, and there are probably others, from which hard cores can be made without the addition of any adhesive. In the New England district the universal base of all core sand mixtures is beach or bank sand and the usual binder is flour, together with a small amount of the proprietary dry mixtures. In the foundry district in and around Philadelphia there is a very large amount of Lumberton, Millville and other sands containing loam or clay used. The characteristic core sand of this section is thus a loamy sand and the usual binder is flour and a certain amount, greater I think than in New England, of the proprietary dry mixtures.

Here, now, are two sands entirely unlike in their physical conditions and self binding powers that are in practice bound and made into cores with the same adhesive material, flour, and requiring about the same amount. It is evident therefore that the binding power of the angles on the sharp sand is replaced by the adhesive property of the loam in the loamy sand.

Results of Using These Sands.

From this view of the situation it would seem that it made no difference which sand was used, that the one

was as good as the other. There is, however, a very great difference in the structure of the two cores. With the sharp sand the angles fit into one another, but not perfectly. The flour particles press into the recesses, rest on the projections and lie against the body of the grain, but not flatly, completely, perfectly, the very irregularity of the shape making the joint between the grains of sand themselves, as well as with the binder, imperfect, and as a consequence the mass is not solid nor compact, but consists of grains tightly and perfectly joined at different points to the surrounding grains, but with open and unjointed parts at other points. In other words, the interstices are not completely filled. Thus the core is porous, though strong, with ample opportunity for the travel through its interior and out to the surface of any gases that may be generated.

With the loamy sand the story is different. Here the binding is entirely dependent upon the adhesive strength of the loam and the flour. With the addition of water, these two mix intimately and easily, and as the rounded and polished surfaces of the sand grains come together under the pressure of the ramming this fluid mass of adhesive—greater in proportion to the whole mass than with the sharp sand, you must remember—is forced and flows into the open space between these grains, a much smaller space than with the angular sand, and as a consequence these inter-grain spaces that would form passages for the travel of the gases are almost closed up. In other words, the interstices are almost completely filled. Thus the core is strong, with the same amount of flour is actually stronger than when made from sharp sand, but very dense and compact.

As a proof of this you will nnd that the man who is using sharp sand as his base for cores seldom or never talks about trouble from his cores blowing. He cares little whether the core and binder offered him has gas in it or not, but the man using the loamy sand is ever on the watch for that point. He knows that he must be careful, and because flour gives off so much smoke and gas when the hot metal strikes it he is ever seeking for a substitute that will give him less trouble and reduce his loss from core blown castings.

Solid and Liquid Binders.

Now it has been noted that the binders commonly used can be divided into two classes, the solids and the liquids, and also that, in preparing the core sand mass, water is invariably added. With the exception of the rosin all of these dry binders are more or less soluble in water. The rosin, after it has been mixed and molded, likewise becomes liquefied or partly so, because of the heat in the core oven.

At the first glance it would seem then that they all became liquids during the operation, and that there is thus really but one class of binders. This is not entirely correct, because, first, some of the mixing is usually done before the water is added; and, second, because only enough water can be added to make the mass properly damp for ramming. This amount is not sufficient to make the dry binder thin, fluid, and in a condition to run freely through the sand. The most casual examination of a rosin made core will show that the sand and binder are very improperly mixed. The rosin can be seen in spots throughout the mass, and it is, as a fact, the poorest and, per unit of volume, the most expensive of the binders, mainly because of the impossibility of proper mixing. This but goes to prove the well-known fact that a more uniform mixture can be attained when a liquid and a solid are put together than when two solids are used. The thinner the liquid the more easily will it run through the mass of sand and the more rapidly and completely will it cover each grain.

It would therefore seem that a liquid binder would, with the least work, give the most perfect mixture, provided, of course, that it was thin enough when put on the sand to flow freely through it. It must also be sufficiently adhesive per unit of bulk so that the amount added will not make the sand too damp. Some experiments recently made for the purpose of proving this theory showed that the efficiency of all of the dry binders could be increased by better mixing, but that the expense of so doing was greater than the cost of the binder that was saved, as, aside from the difference between hand and machine mixing, this means simply longer continued work on the sand mass.

With the liquid binders a somewhat different method seemed possible. Having the idea in mind that the thinner the binder the better the mixture, a material was selected, Gluetrin, that mixed easily and readily with water, and a test was then made by putting this on the sand in the form of a spray with compressed air. At the foundry where this was tried their regular core sand mixture was:

20 per cent. old or gangway sand	$0.00
60 per cent. Millville gravel, at $1.40 per ton	0.84
20 per cent. local sharp sand, at $0.90 per ton	0.18
Total	$1.02

1 part Gluetrin mixed with 1 part of water to each 50 parts of sand.

This sand ran 930 quarts to the ton, and the binder, therefore, at 3¾ cents a quart, cost 70 cents per ton of sand mixed, and the total cost for each ton of core sand, ready for cores, was $1.72. The practice was to put the sand on the floor in three layers as dumped from the wheelbarrows. This was then shoveled and cut over about three times while dry.

The Gluetrin had previously been mixed with an equal amount of water, and was then sprinkled over the bed of sand from a watering pot. The pile was shoveled over once, sprinkled with water, and put through a riddle on a pneumatic shaker and taken to the coremakers. In the first test with the compressed air spraying, the same amount of Gluetrin and water was used and the cores were entirely too hard.

Various trials were made until now their practice is to wheel in the sand and to put it on the floor, as formerly, but as the sand is shoveled and cut over, while dry, it is thrown rather high from the shovels and is met by a spray of Gluetrin and water. This is done twice and it is then put through the riddle as before. The sand mixture is now:

40 per cent. old or gangway sand	$0.00
40 per cent. Millville gravel, at $1.40 per ton	0.56
20 per cent. local sharp sand, at $0.90 per ton	0.18
Total	$0.74

1 part of Gluetrin, mixed with 2 parts of water, to 70 parts of sand. Thus the binder costs but 50 cents per ton of sand mixed, and a total cost of $1.24, as compared to $1.72, a saving of 48 cents per ton.

Here is a credit for old sand, binder and labor, due to the method of mixing alone, and a small debit for compressed air.

As the oils and oil mixtures are too expensive per unit of volume for general use, and this without regard to their merits or faults in any other respect, but few tests were made with them. Such as were made, however, agreed with this result.

The Donora Works Started.—PITTSBURGH, PA., February 8, 1905.—(*By Telegraph.*)—On Tuesday the second blast furnace at the Donora Works of the Carnegie Steel Company was put in blast. Both furnaces at this plant are now in operation and are expected to turn out 1000 tons or more a day of pig iron when they get up to their full output. Three of the 12 50-ton open hearth furnaces at these works have also been started, making their first heat on Tuesday. Three more of these furnaces will be started this week, and when six are running the blooming mill will be started. It is expected to have the entire 12 furnaces in operation within a short time. The product of the open hearth department will be used in the rod, wire and wire nail departments of the plant, which are operated by the American Steel & Wire Company and which have been running right along.

A Light Rail Mill for Edgar Thomson.—Orders have been given for the erection of a new rail mill at the Edgar Thomson Works of the Carnegie Steel Company. It will be a double mill to roll light rails from 8 to 25 pounds per yard, 33 feet long, either from heavy section seconds or from any size of billet. The new mill is to be located between the present rail mill and the Baltimore & Ohio Railroad tracks. It is estimated that the mill will cost about $600,000.

The Iron and Metal Trades

Our monthly blast furnace statistics show that in January production of the works in the United States beat all records, having been 1,776,500 tons, exclusive of Charcoal Iron, which has been running at the rate of 20,000 tons a month during the past six months. This carries the production very close to 1,800,000 tons, or at the rate of 20,750,000 tons per annum. Yet the furnaces have not been in full swing in January, since the weekly capacity has advanced from 377,879 tons per week on January 1 to 404,292 tons on February 1. In spite of the heavy production the stocks of the merchant furnaces declined from 403,000 tons on January 1 to 372,000 tons on February 1, thus indicating a rate of consumption of fully 21,000,000 tons a year. That such a figure should be reached in midwinter is astounding.

There have just been closed purchases by the United States Steel Corporation of Basic and Bessemer Pig Iron in the Pittsburgh district aggregating 25,000 tons, equivalent to $15.50 at Valley furnace, for prompt delivery. In eastern Pennsylvania further round lots of Basic Pig, aggregating about 15,000 tons, have been taken by Steel works, while reports from the South indicate that one Birmingham interest has marketed about 25,000 tons during the past few days. In the New York market a number of the larger founders have been feeling the situation. This is in contrast with the attitude of buyers in the principal distributing centers of the West, who have been holding off lately.

In the Rail trade additional tonnage has been placed, this including some larger orders for Chicago, the 25,000 ton contract of the Baltimore & Ohio Company and a modest share for the lines in this country of the 25,000-ton Grand Trunk order.

The manufacturers of Structural material and of Plates are expected to hold a meeting next week. While leading interests will probably be arrayed against any advance in prices, it is possible, if not probable, that the smaller makers will carry through their desire for a somewhat higher range of prices. They point to the advance in raw materials and to the upward tendency in all other lines of Finished Iron and Steel. It is urged that the demand would not be checked by such a move.

The principal makers of Sheets have announced an advance of $2 per ton on certain sizes, to go into effect at once.

The international markets are growing stronger. During the week the English Plate makers have put up prices 10 shillings per ton without any co-operation. Steel Rails and Billets and Bars are from $3 to $4 per ton higher than they were three months ago.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 8, 1905.	Feb. 1, 1905.	Jan. 11, 1905.	Feb. 10, 1904.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	$17.50	$17.50	$17.50	$14.50
Foundry Pig No. 2, Southern, Cincinnati	16.25	16.25	16.25	12.25
Foundry Pig, No. 2, Local, Chicago	17.50	17.50	17.50	13.75
Bessemer Pig, Pittsburgh	*16.35*	16.60	16.85	13.60
Gray Forge, Pittsburgh	*15.85*	16.10	16.35	12.75
Lake Superior Charcoal, Chicago	18.50	18.50	18.50	16.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	23.00	23.00	23.00	23.00
Steel Forging Billets, Pittsburgh	25.00	25.00	....	....
Steel Billets, Philadelphia	**26.00**	26.00	25.00	24.00
Steel Billets, Chicago	25.00	25.00	25.00	24.00
Wire Rods, Pittsburgh	31.00	31.00	31.00	30.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*15.50*	16.00	16.00	11.00
O. Steel Rails, Philadelphia	*17.50*	17.50	17.75	12.50
O. Iron Rails, Chicago	*20.00*	21.00	21.00	16.50
O. Iron Rails, Philadelphia	**23.00**	23.00	22.50	15.50
O. Car Wheels, Chicago	16.50	16.50	16.50	14.00
O. Car Wheels, Philadelphia	16.00	16.00	16.00	13.00
Heavy Steel Scrap, Pittsburgh	*16.00*	16.00	16.50	13.75
Heavy Steel Scrap, Chicago	*14.00*	14.50	15.00	10.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.65	1.35
Common Iron Bars, Chicago	1.65	1.65	1.65	1.40
Common Iron Bars, Pittsburgh	*1.65*	1.65	1.69¾	1.34⅜
Steel Bars, Tidewater	1.54½	1.54½	1.54½	1.44½
Steel Bars, Pittsburgh	1.40	1.40	1.40	1.30
Tank Plates, Tidewater	1.64½	1.64½	1.64½	1.74½
Tank Plates, Pittsburgh	1.50	1.50	1.50	1.60
Beams, Tidewater	1.64½	1.64½	1.64½	1.74½
Beams, Pittsburgh	1.50	1.50	1.50	1.60
Angles, Tidewater	1.64½	1.64½	1.64½	1.74½
Angles, Pittsburgh	1.50	1.50	1.50	1.60
Skelp, Grooved Steel, Pittsburgh	**1.50**	1.55	1.45	1.42½
Skelp, Sheared Steel, Pittsburgh	**1.55**	1.60	1.50	1.50
Sheets, No. 27, Pittsburgh	2.20	2.20	2.20	2.15
Barb Wire, Pittsburgh	**2.25**	2.25	2.20	2.50
Wire Nails, Pittsburgh	**1.80**	1.80	1.75	1.90
Cut Nails, Pittsburgh	**1.80**	1.75	1.75	1.70
METALS:				
Copper, New York	**15.25**	15.25	15.12½	12.12½
Spelter, St. Louis	*6.00*	6.05	6.15	4.67½
Lead, New York	*4.55*	4.45	4.60	4.40
Lead, St. Louis	*4.35*	4.37½	4.52½	4.25
Tin, New York	**29.32½**	29.65	29.05	27.95
Antimony, Hallett, New York	8.50	8.50	8.75	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, February 8, 1905.—(*By Telegraph.*)

There is no denying the fact that current business is exceptionally light, and were it not for the fact that mills and furnaces have orders on their books that will keep them busy for some months to come a break in prices would be in order. Foundrymen all over the West have overbought in Pig Iron, and the accommodations which they received from producers in the way of extension of time on payment in consideration of permitting the advance delivery of the Iron has led them to stock their yards so full that they have scarcely room to turn and have practically no room to store Scrap. The immediate result of this condition is twofold. In the first place, the buying of Foundry Iron is practically at a standstill, and, in the next place, the purchase of Scrap has resolved itself into pick up business to meet current requirements. This, coupled with the fact that the large users of Scrap, the Iron and Steel Bar makers, have been out of the market for some weeks, has resulted in a serious slump in Scrap prices. In markets tributary to Chicago Southern Irons are not salable at higher than $13.50, Birmingham basis, for first and second quarters, and Northern Irons are at their maximum at $17.50, delivered. Furnaces are beginning to show anxiety as to their tonnage for the second half of the year, and overtures on their part meet an unresponsive market. The same is true with Finished Materials. Practically no new business is being booked on Plates, Structural Steel and Bars. Some business is in evidence on Pipe, both Cast and Welded. Sheets are a little stronger in tone, but not sufficiently so to induce the leading Western interest to start its mills, which have been idle for a number of months. There is no change in the Billet and Rail situation. Trading in Wire products is quite active. Metals are stationary and in slow demand.

Coke is coming to this market more freely than it has for two months, and though prices have not actually broken they are softer than they were a week ago.

Old Materials.—A very decided break, ranging from 50c. to $1.50 a ton, has taken place in this market. This is due to the fact that the Republic Iron & Steel Company, the Inland Steel Company and other large buyers are conspicuous for their absence in the market and that foundrymen all through the West have tied up their capital and their space in Pig Iron to such an extent that their purchase of Scrap is narrowed to daily necessities. The only noteworthy feature in the Scrap market is the fact that Steel Rails from 1 to 4 feet in length rule higher than Rails over 4 feet. This is due to the increased demand on the part of makers of semifinished Steel, who use Rails largely in connection with Pig Iron to make their melts, and their furnaces are so small that they cannot use over about 2-foot lengths. The Chicago & Northwestern and the Santa Fé have both sold large tonnages and realized prices that were disappointing to them. We quote per gross ton:

Old Iron Rails	$20.00 to $20 50
Old Steel Rails, 4 feet and over	15.00 to 15.50
Old Steel Rails, less than 4 feet	15.50 to 16.00
Heavy Relaying Rails, subject to inspection	22.50 to 23.00
Heavy Relaying Rails, for side tracks	20.00 to 20.50
Old Car Wheels	16.50 to 16.75
Heavy Melting Steel Scrap	14.00 to 14.50
Frogs, Switches and Guards	14.00 to 14.50
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$17.50 to $18.00
Iron Car Axles	21.00 to 21.50
Steel Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	17.00 to 17.50
No. 2 Railroad Wrought	15.50 to 16.00
Shafting	16.50 to 17.00
No. 1 Dealers' Forge	13.50 to 14.00
Wrought Pipes and Flues	11.50 to 12.00
No. 1 Cut Busheling	11.50 to 12.00
Iron Axle Turnings	11.50 to 12.00
Soft Steel Axle Turnings	11.50 to 12.00
Machine Shop Turnings	11.00 to 11.50
Cast Borings	8.75 to 9.00
Mixed Borings, &c	8.75 to 9.00
No. 1 Mill	9.50 to 9.75
Country Sheet	8.00 to 8.50
No. 1 Boilers, cut to Sheets and Rings	11.50 to 12.00
No. 1 Cast Scrap	13.00 to 13.50
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	13.75 to 14.00
Agricultural Malleable	12.50 to 13.00

Metals.—The market is weak, with trading practically at a standstill. Prices, though soft, have not changed actually from last week's figures. Copper remains steady at 15⅛c. to 15¼c. for Casting, and 15⅜c. to 15⅝c. for Lake, in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.45c., in car lots at 4.50c., and 5c. to 5¼c. in small lots. Pig Tin is unchanged at 30c. to 30½c. in car lots. Spelter is advanced for car lots, but unchanged for small lots, the car lot price being 6.15c. and the small lot price 6½c. Sheet Zinc is held at $7.50, base, Lasalle, equivalent after deducting discounts to $7.25, Chicago, for car lots of 600-lb. casks, with small lots selling at $7.50 to $8. Prices of Old Metals are unchanged, as follows: Copper Wire, 13¼c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 11⅞c.; Red Brass Borings, 10c.; Yellow Brass, Heavy, 9c.; Yellow Brass Borings, 7¼c.; Light Brass, 7¼c.; Lead Pipe, 4¼c.; Tea Lead, 4c.; Zinc, 4½c.; Pewter, No. 1, 19¼c.; Block Tin Pipe, 25c.

(By Mail.)

CHICAGO, February 6, 1905.

Pig Iron.—There are no changes either in price or in general trade conditions in the Pig Iron market. Buying is almost at a standstill and any business placed is usually for the third quarter, in which case the overtures are more likely to come from the seller than from the buyer. It appears that furnaces are pretty well filled up with business for the first half of the year and that they are beginning to send out feelers for trade beyond that period. Buyers as a rule seem apathetic and are none too anxious to place contracts for delivery beyond next July at present prices. On the other hand, a number of furnaces are refusing to quote beyond July. Two large radiator companies have bought fairly large tonnages within the last ten days, presumably for delivery beyond next July, although the terms of delivery are not divulged. We repeat last week's quotations without change:

Lake Superior Charcoal	$18.50 to $19.00
Northern Coke Foundry, No. 1	18.00
Northern Coke Foundry, No. 2	17.50
Northern Coke Foundry, No. 3	17.00
Northern Scotch, No. 1	18.00 to 18.50
Ohio Strong Softeners, No. 1	19.30 to 19.80
Ohio Strong Softeners, No. 2	18.80 to 19.30
Southern Silvery, 4 to 6 per cent. Silicon	18.65 to 19 65
Southern Coke, No. 1	17.65 to 17.90
Southern Coke, No. 2	17.15 to 17.40
Southern Coke, No. 3	16.65 to 16.90
Southern Coke, No. 4	16.40 to 16.65
Southern Coke, No. 1 Soft	17 65 to 17.90
Southern Coke, No. 2 Soft	17.15 to 17.40
Southern Gray Forge	16.50 to 16.75
Southern Mottled and White	15.90 to 16.15
Malleable Bessemer	17.50
Standard Bessemer	18.50 to 19.00
Jackson County and Kentucky Silvery, 6 to 8 per cent Silicon	20.30 to 22.30
Jackson County and Kentucky Silvery, 10 per cent. Silicon	23.30
Alabama Basic	17.15 to 17.40
Virginia Basic	17.15 to 17.40

Billets.—The scarcity of Billets is becoming formidable to forge shops and other users not fully covered by contracts. About the lowest price obtainable for Forging Billets in this market is $28, and prices range from there up to $32 a ton, according to the importance of the buyer to the seller. Bessemer Billets, which are officially quoted at $21 at Pittsburgh or $24, Chicago, are unobtainable here at less than $25 for base sizes, if at that price, and sales are reported as high as $27 and $28. Sizes larger than 16 square inches in section up to, but not including, 100 square inches are held at $2 premium over the base size.

Rails and Track Supplies.—No orders of any magnitude have been taken since last week's report. About 35,000 tons have been booked thus far for the Western mill since February 1. We quote Standard Section Rails in 500 ton lots and greater, $28, at mill. Light Rails, f.o.b. Milwaukee mill, on about the following basis: 8 and 10 lb. Sections, $28; 12-lb., $27; 16-lb., $26; 20 and 25 lb., $25; 30 to 45 lb. Sections, $24; Angle Bars, 1.40c. to 1.50c.; Spikes, 1.70c. to 1.75c.; Track Bolts, 2.40c. to 2.50c., base, with Square Nuts, and 10c. to 15c. higher for Hexagon Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Material.—Current business is extremely light, and no large contracts have been placed for several weeks. Quotations are unchanged as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.66½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.66½c.; Angles, larger than 6 inches on one or both legs, 1.76½c.; Beams, larger than 15 inches, 1.76½c.; Zees, 3 inches and over, 1.66½c.; Tees, 3 inches and over, 1.71½c., with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Local jobbers quote the minimum price on Angles, Beams and Channels, 1.90c., with 10c. advance for 18, 20 and 24 inch Beams and for Angles larger than 6 inches on one or both legs. These prices are for either random lengths or cut to lengths, but 10c. to 15c. higher is charged for very small or wasteful lots.

Plates.—Business is very light, but mills are making no effort to force buying, as their order books already contain enough business to keep the rolls busy for some months. Official car lot prices at Chicago for shipment from mill are: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, carloads, Chicago, 1.66½c.; 3-16 inch, 1.76½c.; Nos. 7 and 8 gauge, 1.81½c.; No. 9, 1.91½c.; Tank quality, 6 to 14 inches wide, 10c. below these prices; Flange quality, any width up to 100 inches, 1.76½c.; Sketch Plates, in Tank quality, 1.76½c.; in Flange quality, 1.86½c. Store prices are as follows: Tank Plate, ¼-inch and heavier up to 72 inches wide, 1.90c. to 2c.; from 72 to 96 inches wide, 2c. to 2.10c.; 3-16 inch up to 60 inches wide, 2c. to 2.10c.; 72 inches wide, 2.25c. to 2.35c.; No. 8 up to 60 inches wide, 2.95c. to 2.15c.; Flange quality, 25c. extra.

Sheets.—There is some improvement in inquiry for Sheets and independent makers are beginning to persuade themselves that in spite of the large tonnages booked by the leading producer several months ago the spring demand will be sufficient to keep all the rolls busy. However, it is hard to figure out how the independent mill can buy its Sheet Bars at present prices and deliver Sheets at the ruling prices without taking a loss. Official prices named by the leading producer for car lots and greater at Chicago, delivered from mill, have as their minimum the following figures: Nos. 9 and 10, 1.81½c.; Nos. 11 and 12, 1.86½c.; Nos. 13 and 14, 1.91½c.; Nos. 15 and 16, 1.96½c.; Nos. 18 and 20, 2.21½c.; Nos. 22 and 24, 2.26½c.; Nos. 25 and 26, 2.31½c.; No. 27, 2.36½c.; No. 28, 2.46½c.; No. 29, 2.61½c.; No. 30, 2.71½c. Store prices rule as follows: Blue Annealed Sheets, No. 10, 2.05c. to 2.15c.; No. 12, 2.10c. to 2.20c.; No. 14, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c.; Nos. 18 and 20, 2.45c. to 2.50c.; Nos. 22 and 24, 2.50c. to 2.60c.; No. 26, 2.55c. to 2.65c.; No. 27, 2.60c. to 2.70c.; No. 28, 2.70c. to 2.80c. Galvanized Sheets are unchanged but strong at the following net prices, f.o.b. Chicago, in car lots from mill: No. 16, 2.61½c.; Nos. 18 and 20, 2.76½c.; Nos. 22 and 24, 2.91½c.; No. 26, 3.11½c.; No. 27, 3.31½c.; No. 28, 3.51½c. These prices range from 75, 10 and 10 at Pittsburgh in the heavier gauges to 80 and 2½ in the lighter. Net prices quoted by local jobbers on Galvanized are as follows: Nos. 10 to 18, inclusive, up to 36 inches wide, 3c. to 3.10c.; No. 20 up to 30 inches wide, 3c. to 3.10c.; Nos. 22 to 24, 3.15c. to 3.25c.; No. 26, 3.40c. to 3.50c.; No. 27, 3.60c. to 3.70c.; No. 28, 3.85c. to 3.95c.; No. 29, 3.75c. to 3.90c.; extras for Sheets wider than 30 inches are charged on gauges No. 20 and lighter, the extras varying with the widths and gauges. Such dealers as sell on the discount basis quote the following minimum figures: Nos.

10, 12 and 14, 36 to 48 inches wide, 75 to 75 and 10 per cent.; No. 16, 75 and 2½ to 70 and 10 per cent.; Nos. 18 and 20, 75 and 7½ to 70 and 10 per cent.; Nos. 22 and lighter, 70 and 10 per cent.

Bars.—Steel Bars and Bands are firm at 1.56½c., base, half extras, for either Bessemer or Open Hearth, and what little business is done in Iron Bars and Bands is done at about 1.65c. basis. Soft Steel Hoops are firm at 1.71½c. rates, full extras, in car lots; Soft Steel Angles, Channels, Tees and Shapes belonging to the Bar class, 1.66½c., half extras, Chicago, in car lots. Quantity differentials are added to the regular extras for size and for less than car lots, as follows: Less than 2000 lbs. down to 1000 lbs. of a size, 10c. extra; less than 1000 lbs. of a size, 30c. extra. Store prices on Iron Bars are held at 1.85c. to 2c., the bulk of the business being on the basis of 1.90c. Steel Bars and Bands from store are held down to 1.75c., base, half extras, by the attitude of one large producer, who has a warehouse connection here. Soft Steel Angles and Shapes, 1.85c., half extras; Soft Steel Hoops, 2.10c., full extras. On Soft Steel Bars, Angles, Shapes and Hoops from store 5c. to 10c. higher than these minimum prices is charged for small quantities.

Merchant Steel.—Current specifications show less activity than they did some weeks ago, but the aggregate booked thus far by the mills is sufficient to make them indifferent as to whether their customers specify at once or delay somewhat later. There seems to be some danger, however, that these delayed specifications may be bunched toward the end of the season and thus swamp the mills. Smooth Finished Machinery Steel, 1.81½c.; Smooth Finished Tire, 1.76½c.; Flat Sleigh Shoe, 1.61½c.; Concave and Convex Sleigh Shoe, 1.76½c.; Cutter Shoe, 2.30c.; Toe Calk Steel, 2.11½c.; Railway Spring, 1.76½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up. Shafting is unchanged for the present at 52 per cent. discount in car lots and 47 per cent. in less than car lots in base territory.

Merchant Pipe.—As intimated in this report last week the leading producer of Pipe made changes in discount which advance the price about $1 a ton. The new schedule in car lots, Chicago, is as follows:

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ to ¼ inch	66.35	50.35	64.35	48.35
⅜ to ½ inch	70.35	58.35	66.35	56.35
¾ to 6 inches	74.35	54.35	72.85	62.85
7 to 12 inches	69.35	54.35	67.85	52.35
Extra strong pipe, ⅛ to ⅜ inch	59.35	47.35	57.35	45.35
½ to 4 inches	66.35	54.35	64.35	52.35
4½ to 8 inches	62.35	50.35	60.35	48.35
Double extra strong pipe, ½ to 8 inches	55.35	44.35	53.35	42.35

Boiler Tubes.—Railroads are becoming very heavy buyers of Boiler Tubes for locomotive shops, and contract boiler shops are also doing better in that respect than they had done for some months. Prices are unchanged, the official discounts on less than car lots, Chicago, for shipment from mill being:

	Steel.	Iron.	Seamless.
1 to 1½ inches	42.35	39.35	52.35
1¾ to 2¼ inches	54.35	39.35	40.35
2½ inches	56.35	44.35	43.35
2¾ to 5 inches	62.35	51.35	up to 4 in. 50.85
6 to 13 inches	54.35	39.35	....

Consumers who buy in car lots are officially quoted 2 points lower discounts, while jobbers are named prices that give them a merchandising profit.

New store prices on Boiler Tubes as announced in our last report are about as follows, though there is no agreement and no unanimity of prices between local jobbers as there once was:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	37½
2¾ to 5 inches	60	47½	45
6 inches and larger	50	..	..

Cast Iron Pipe.—No contracts of consequence have been closed and prices are unchanged, but the tone of the market is strong and there is every prospect that the spring season, which is about to open up, will develop an unusual tonnage. Prices are firm at $28.50 a gross ton for 4-inch Water Pipe and $27.50 for 6-inch and larger, with $1 extra for Gas Pipe.

Coke.—The Coke situation is a little less strained than it was a week ago, as the railroads have succeeded in furnishing sufficient rolling stock to take care of an extremely large tonnage. The going price for first quality 72-hour Foundry is $3, Connellsville, or $5.65, Chicago, though there is a lot of Coke from the Connellsville region in the market at $2.75, while a number of Virginia and West Virginia Cokes are quoted at the basis of $2.50 to $2.75 at the ovens, plus the same $2.65 freight to Chicago. Wise County, Va., operators are asking $3 to $3.25 at the ovens, plus $2.25 freight rate. Milwaukee Solvay is quoted to foundries at $5.65, Chicago, in car lots.

Philadelphia.

FORREST BUILDING, February 7, 1905.

Considering the bad weather and other interruptions to business during the past week, the Iron and Steel markets have shown remarkable strength. The demand has not been particularly heavy, but deliveries are so urgently called for that it is impossible to resist the conviction that things are better than appears on the surface. This is further confirmed by the fact that prices are absolutely impregnable. There is no worrying about new business, as there is plenty to go on with, and there are many indications of a great demand in the near future. Moreover, consumers of Pig Iron and Scrap Material feel that they are not getting prices in proportion to the increased cost, and as they see no way to make reductions, they are naturally firm in regard to selling prices. The condition of their order books, combined with a good day-to-day demand, will enable them to continue this policy almost indefinitely, although there are strong evidences that the present dullness will not continue for any length of time. Better weather would be very helpful, but this, of course, is merely a question of time. Activity is not pre-eminent in any particular line, but business is so evenly distributed that the aggregate volume is surprisingly large, yet it attracts little attention until the character of the distribution is looked into, when it becomes very clear that it is an all round resumption of business activity. The Finished Material end is somewhat of an enigma, yet there is very little hunting around for business. There appears to be no unusual activity, yet there is hardly a mill anywhere but can run comfortably full. Specifications come in fairly well, and there is a heavy tonnage on the books, while the day-to-day demand offsets any delays that may occur in securing specifications on back orders. Prices are very firm, and in some cases are at a slight premium over the official quotations, so that taking everything into account conditions may be said to be very satisfactory and full of promise as regards the spring and summer trade.

Pig Iron.—Recent movements indicate that stocks of Pig Iron are not increasing. There may be a slight accumulation of low grades, but standard qualities are taken as rapidly as they can be shipped, so that prices of such are firmly maintained. Considerable interest is manifested in regard to the forthcoming furnace report, which should give a fairly correct outline of the statistical situation. If the output proves to be larger than during December it will be likely to check further advances, or if stocks have increased the same result may be expected, while the reverse of this would pretty surely tend toward higher quotations. The opinion of the trade and the undoubted paucity of stocks in this district favor the last named proposition, but the United States is a big field and all the districts need to be heard from before a final opinion can be reached. As regards the local market, the most prominent feature is the extremely light offerings. There is no actual scarcity, unless it may be in Basic Iron, which is so well taken up that there is practically nothing for sale. When consumers need Iron, however, they have to ask for it, makers having nothing worth offering in the open market. In this way several lots of 2000 to 5000 tons each have been taken during the past few days, and further business could be done if makers or sellers made a motion to that effect. Foundry grades move easily in small and medium sized lots, which is practically all that furnaces can spare, as most of their output is being taken on old contracts. Low grades are still in large supply and can be had at relatively low prices, the range for all grades, Philadelphia and nearby deliveries, being about as follows:

No. 1 X Foundry	$17.75 to $18.00
No. 2 X Foundry	17.50 to 17.75
No. 2 Plain	16.75 to 17.00
Standard Gray Forge	15.50 to 16.00
Ordinary Gray Forge	15.25 to 15.50
Basic	16.50
Low Phosphorus	$20.00 to 20.25

Steel.—Prices are very firm and look like working higher. Business has been done at $26 on large orders, but mills are so full of work that buyers would probably have to pay more money on additional business.

Muck Bars.—There is no change from last week and not much disposition to do business. Buyers would probably pay $29 to $29.50, delivered, but sellers quote the outside figure f.o.b. their mills.

Plates.—There is nothing of special interest in this department. New business is not in notably large volume, but mills are more fully employed than they have been for months past, although there is no difficulty in making deliveries as promptly as are required. Prospects for the spring and summer months are regarded as highly favorable, however, and it is not unlikely that prices will be slightly advanced, as they are not in proportion to the costs of raw materials. Meanwhile quotations are about as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.63½	1.68½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under	1.53½	1.58½
Flange or Boiler Steel	1.73½	1.78½

Marine, A. B. M. A. and Commercial		
Fire Box Steel	1.83½	1.88½
Still Bottom Steel	1.93½	1.98½
Locomotive Fire Box Steel	2.13½	2.18½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100
3-16-inch thick	$0.10 pounds extra.
Nos. 7 and 8, B. W. G	.15 "
No. 9 B. W. G	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—There is a very good feeling as regards this interest, as a large amount of work is likely to come out in the near future. Railways will be in the market for bridges and general equipment, so that considerable activity is looked for during the spring and summer months. Orders on the books are quite important, but specifications are rather slow, which permits quick deliveries on day to day orders. Prices remain about as follows: Beams, Channels and Angles, 1.63½c. to 1.75c., according to specifications, and small Angles, 1.55c. to 1.60c.

Bars.—The Bar trade appears to be in better condition than it has been for a long time past. Mills are running pretty full and have about all the business they want. Prices are in most cases a tenth above the association prices, some mills getting more than that, but a fair average for good Refined Iron is 1.63½c. to 1.70c., while in some cases 1.75c. is paid for extra quality of Refined Iron. Steel Bars are firm at 1.53½c. to 1.60c., according to what may be required.

Sheets.—There is a good demand for spot lots, but prices are not satisfactory considering the cost of production.

Old Material.—The market is very stubborn, and is hotly contested by the various conflicting interests. Consumers are working for lower prices, but stocks are so well under control that no impression has been made on prices, and with any increase in the demand it is not unlikely that they will be marked up. Meanwhile bids and offers for deliveries in buyers' yards are about as follows:

Old Steel Rails	$17.50 to $18.00
No. 1 Steel Scrap	17.25 to 17.75
Old Steel Axles	20.00 to 21.00
Old Iron Axles	23.00 to 24.00
Old Iron Rails	23.00 to 24.00
Old Car Wheels	16.00 to 16.50
Choice Scrap, R. R. No. 1 Wrought	21.50 to 22.50
No. 1 Yard Scrap	18.00 to 19.00
Machinery Scrap	15.50 to 16.00
Low Phosphorus Scrap	20.50 to 21.50
Wrought Iron Pipe	16.50 to 17.00
No. 1 Forge Fire Scrap	16.50 to 17.00
No. 2 Forge Fire Scrap, Ordinary	12.00 to 13.00
Wrought Turnings	14.50 to 15.00
Axle Turnings, Choice Heavy	16.00 to 16.50
Cast Borings	11.25 to 11.50
Stove Plates	13.50 to 14.00

Cincinnati.

FIFTH AND MAIN STS., February 8, 1905.—(*By Telegraph.*)

Pig Iron.—The market during the past week has been unusually quiet and dull. Scarcely any inquiries have developed and we are unable to learn of a single sale where there has been any considerable tonnage involved. One agent reports that a disposition seems to exist among buyers to take hold of the market in a more substantial manner than has been the case for ten days past, but this expression of opinion is, we apprehend, the exception and not the rule. Furnaces for the most part are not pressing for sales into second quarter and, as consumers generally have been taken care of for the first, there is apparently little demand at the present time. Within the next three or four weeks it will be necessary for them to consider the requirements for second quarter delivery, and this, it is predicted, will in a measure cause renewed activity. Reports indicate that the market in the East is much more brisk than in the West, especially the Central West. Just what effect this stagnation at the present time will have upon the price is a debatable question, although the consensus of opinion seems to be that unless a buying movement is quickly evolved we shall see prices a shade lower within the next few weeks. Industries like Car Wheel works and Soil Pipe foundries are said to be exceptionally busy and are now figuring on a further supply of Iron. Established quotations on both Southern and Northern are unchanged from last week's figures and are said to be subject to no shading. Freight rates from Hanging Rock district, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$16.75
Southern Coke, No. 2	16.25
Southern Coke, No. 3	15.75
Southern Coke, No. 4	15.50
Southern Coke, No. 1 Soft	16.75
Southern Coke, No. 2 Soft	16.25
Southern Coke, Gray Forge	15.25
Southern Coke, Mottled	$14.75 to 15.00
Ohio Silvery, No. 1	20.65 to 21.15
Lake Superior Coke, No. 1	17.65
Lake Superior Coke, No. 2	17.15
Lake Superior Coke, No. 3	16.65

Car Wheel and Malleable Iron.

Standard Southern Car Wheel	$18.50 to $19.00
Lake Superior Car Wheel and Malleable	18.00 to 18.50

Coke.—The continued cold weather has not been without its effect on production. Reports from Pittsburgh district show, in addition to this, there have been severe strictures on account of insufficient motive power and equipment. Prices are holding firm and demand is good. We quote from $2.25 to $3, f.o.b. ovens, for the best Connellsville Foundry grades.

Plates and Bars.—Jobbers are said to be busy as a result of the mills being unable to supply and deliver. Trade in Bar Iron is first class, and, as distillers are becoming busy, there is a growing demand for Hoop Iron. The demand in the Plate line is only fair, with Structural Iron in increased demand. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.53c., with half extras; the same in smaller lots, 1.75c., with full extras; Base Angles, 1.63c., in carload lots; Beams and Channels, in carload lots, 1.63c.; Plates, ¼-inch and heavier, 1.63c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; smaller lots, 2.70c.; 14-gauge, in carload lots, 2.0oc.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.73c., in carload lots.

Old Material.—Business is a little quiet. Prices are unchanged as far as we can learn, the tonnage of the week being light. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $17 to $18 per net ton; No. 1 Cast Scrap, $14 to $14.50 per net ton; Iron Rails, $21.50 to $22 per gross ton; Steel Rails, rolling mill lengths, $14.50 to $15 per gross ton; Relaying Rails, 56-lb. and upward, $23 per gross ton; Iron Axles, $21 to $22 per net ton; Car Wheels, $16 to $17 per gross ton; Heavy Melting Scrap, $14.50 to $15 per gross ton; Low Phosphorus Scrap, $17 to $18 per gross ton.

Cleveland.

CLEVELAND, OHIO, February 7, 1905.

Iron Ore.—There has not been quite so much buying of Iron Ore during the past week. Estimates of the quantity which has been sold, based upon the estimate of total output, are not reliable, since it is impossible to tell what percentage of that amount will be produced by the consuming producers. One thing seems evident: It is that the strictly merchant mines will seek a wider field than the old territory which has been dependent upon their mines, in the hope that they may be able to increase their output. Prices hold about as they have been, as follows: Bessemer Old Range, $3.75; Bessemer Mesaba, $3.50; non-Bessemer Old Range, $3.25, and non-Bessemer Mesaba, $3, all f.o.b. Lake Erie ports. There has been some little inquiry for vessel capacity with which to move the Ore to be produced. The vessel owners have taken their accustomed stand, holding for 90c. from the head of the lakes, with proportionate rates from Marquette and Escanaba. It is improbable, with the present supply of tonnage and other lake conditions, that the vessel owners should be able to secure such contracts, and therefore the demand is considered purely a nominal one. The labor situation on the lakes is becoming ominous, and the present status indicates that it will have an influence in shaping the rates which are to be paid. The vessel owners, through their association, having declared for an open shop, the pilots of the lakes—the backbone of last spring's long strike—have affiliated themselves with the 'longshoremen in an effort to throw the power and strength of the two organizations against the vessel owners' organization and compel it to yield. A repetition of last spring's strike can only be avoided by a quick change of front on the part of one or the other side to the controversy.

Pig Iron.—The Foundry Iron market is beginning to show a little more animation than has been seen in the past few weeks. It is far from buoyant or strong, but there is an increasing tendency on the part of consumers to cover their needs for the second quarter and even to spread over into the third quarter. The furnaces, with the appearance of new business, even in the distance, are disposed to get a little stronger prices. The ruling sentiment, however, is strongly tinctured with conservatism, some of the producers being against any further rise in price, in the fear of shutting off the buying movement. There is very little being sold for immediate shipment, but such as is sold goes at $16 in the Valleys for No. 2. There is only a little buying of Bessemer Iron and the prices vary. Small lots are sold at prices ranging from $16 to $16.50 in the Valleys. The Coke situation is about as it has been. There is a good supply, with prices easier. The best 72-hour Foundry Coke is selling at $2.75 to $3, while Furnace Coke is sold at $2.50 to $2.75 at the oven.

Finished Iron and Steel.—After the recent rather heavy buying in Bar Iron consumers have about withdrawn from the market, but the mills are so well supplied that they show no weakness. Most of the mills which have received the larger orders have been well supplied with Scrap and

have not turned buyers. The consequent easing of the prices of Scrap has therefore promised something in the way of better prices on Bar Iron. But any reduction seems remote at best now. The smaller mills are still picking up some little business at prices ranging from 1.60c. to 1.65c., Youngstown, while the larger mills are holding for 1.70c. on general specifications. The increased activity, which is being seen in the building trade in Cleveland, together with the betterment of the trade generally, has stiffened the Structural market. The matter of delivery is a serious one at the present time, and those who need Shapes quickly are forced to pay premiums for them either to the jobber or the small mills. The Plate trade presents nothing new. It is a question of delivery on specifications, which are increasingly heavy. There is some increased activity in the Sheet trade. The time is approaching when many of the Sheet consumers will need an increased supply, and they are beginning to buy against their needs. They are somewhat hampered in this, however, by the fact that the mills are refusing to sell on contracts. The market is steady at 2.50c. for Nos. 22 to 24 Black Sheets out of stock, while the same gauges are selling at 2.20c. in car lots at the mills. The market for Standard Rails is dull for the present, but good inquiries are in from some traction companies which are planning to expand their territory somewhat. Light Rails are in good demand at steady prices.

Old Material.—The Scrap market has been rather quiet and inclined to dullness. The expected buying did not appear and the market turned somewhat easier. The dealers, expecting to unload upon the mills, had collected a good deal of material, which they have been inclined to sacrifice, due to the lack of yard room. This has given a somewhat easier tone to the market. The break has not been general, however. We revise quotations, most prices being nominal, all gross tons: Old Steel Rails, $16 to $16.50; Old Iron Rails, $23 to $23.50; Old Car Wheels, $17; Heavy Melting Steel, $16 to $17. All net tons: Cast Borings, $8.50 to $9; No. 1 Busheling, $14 to $15; No. 1 Railroad Wrought, $18 to $19; Iron Car Axles (nominal), $20 to $21; No. 1 Cast, $14.50 to $15; Stove Plate, $11 to $12; Iron and Steel Turnings and Drillings, $11.50 to $12.50. Borings are selling freely.

Pittsburgh.

PARK BUILDING, February 8, 1905.—(*By Telegraph.*)

Pig Iron.—This morning details were completed by which the United States Steel Corporation has purchased 10,000 tons of Bessemer Pig Iron from W. P. Snyder & Co. and 15,000 tons from the Bessemer Pig Iron Association, all for February shipment, the price being $15.50, Valley furnace. Most of this Iron will be shipped to the Homestead Steel Works, which has been very short of metal right along, while part of it may go to the Vandergrift Works of the American Sheet & Tin Plate Company. This purchase of 25,000 tons of Pig Iron by the Steel Corporation comes at an opportune time and is expected to have the effect of greatly strengthening the market, which has been dull for several weeks, while prices are somewhat easier. It will clean up a good deal of surplus Iron and establishes the market for Bessemer and Basic at $15.50, Valley furnace. There is more or less Bessemer and Basic Iron being offered for resale by brokers, but this is in small lots and is mostly Iron that has to be moved. Some of this has been offered a trifle under $15.50, Valley furnace, but it is difficult to find purchasers for it, as the leading Steel interest refuses as a rule to negotiate with brokers for Iron, and they are thus compelled to offer it to small consumers. We quote Bessemer and Basic Iron at $15.50, Valley furnace, but it is possible that on small lots for prompt shipment this price might be slightly shaded. The demand for Foundry Iron is rather quiet, and Northern brands of No. 2 are held at about $16, Valley furnace, equal to $16.85, Pittsburgh. We note some small sales aggregating about 1000 tons at this price. The demand for Forge Pig Iron is also quiet, as large consumers are pretty well covered, and prices are somewhat easier. We quote Northern brands at $15 to $15.15, f.o.b. Valley furnace, equal to $15.85 and $16, Pittsburgh. We note a sale of 500 tons of Northern Gray Forge at $15, Valley furnace.

Steel.—The Steel market continues very active, the demand for Billets and Sheet and Tin Bars being especially heavy and beyond the capacity of the mills to furnish promptly. In fact, Billets, Sheet and Tin Bars for prompt delivery readily command $2 to $3 a ton over the official prices. We quote Bessemer and Open Hearth Billets up to 0.20 carbon at $23 to $24, and Sheet and Tin Bars in long lengths at $25 to $26, f.o.b. maker's mill. Forging Billets are held at $25 to $26 at maker's mill, depending on carbons.

(*By Mail.*)

The past week in the Iron trade has been without special feature and there have been no important changes in prices. It is expected that the United States Steel Corporation will buy from 25,000 to 50,000 tons of Bessemer and Basic Iron for February. The Pig Iron market is quiet and prices are easier and slightly lower. This is due to the fact that a good deal of Bessemer and Basic Iron is being offered for resale by dealers, including one lot of 7000 tons, which the Lackawanna Steel Company is offering in this market, this being the Iron taken some time ago in exchange for 7000 tons of Heavy Melting Stock. The top of the market to-day on Bessemer and Basic Iron is $15.50, Valley furnace, but on a firm offer this price could be shaded; in fact, we are advised that Bessemer and Basic Iron has been offered at a shade under $15.50 without finding buyers. Forge Iron is also easier in price and Northern brands are offered as low as $15, Valley furnace, equal to $15.85 Pittsburgh, a decline of about 50c. a ton in the past week or ten days. There is a fairly active demand for Foundry Iron, Northern brands of No. 2 being held at $16, Valley furnace, equal to $16.85, Pittsburgh. It is thought the lull in the Pig Iron market will not continue long and that there will be no serious decline in prices. The Steel market continues very active and consumers of Sheet and Tin Bars are having trouble in getting deliveries, particularly for Open Hearth Steel. Billets and Bars continue to command $2 to $3 a ton over official prices for prompt delivery.

In Finished Iron and Steel the tonnage is fairly large, but not as heavy as in December and early in January. However, the finishing mills have very heavy contracts on which buyers are specifying freely and which give the mills plenty of work. An advance in prices of Sheets and Tin Plate by the leading interest would not be a surprise to the trade, but, in fact, is expected at any time.

Ferromanganese.—Owing to activity in the Steel trade the demand for Ferro continues heavy, and a good deal of tonnage is being sold. Prices are firm on the basis of $45, delivered, for 80 per cent. English and domestic in large lots.

Rods.—The demand for Rods has been rather quiet in the past week or two, but the market is firm on account of high prices of Steel. We quote Bessemer and Open Hearth Rods at $31 to $31.50, f.o.b. Pittsburgh.

Skelp.—The demand for Skelp has quieted down in the past week, leading consumers being covered and out of the market for the time being. We quote Grooved Iron Skelp, ordinary gauges and widths, at 1.70c. to 1.75c.; Sheared, 1.80c. to 1.85c.; Grooved Steel Skelp, 1.50c. to 1.55c., and Sheared, 1.55c. to 1.60c. Some mills are quoting higher prices than this, as they are pretty well filled up and practically out of the market as sellers.

Muck Bar.—There has been very little done in Muck Bar in the past week or two, but the market is fairly strong. We quote best grades of Muck Bar made from all Pig Iron at $28.50 to $28.75, f.o.b. Pittsburgh, and note a sale of 300 tons at the latter price.

Steel Rails.—There is a fair amount of activity in the Steel Rail trade, the tonnage booked for this year being reported as slightly in excess of 1,000,000 tons. However, some of the leading roads have not yet come into the market as buyers, but are expected to do so before long. We quote Standard Sections at $28, at mill. There is a fair amount of inquiry for Light Rails, which we quote at $23.50 to $26, depending on the weight

Structural Material.—In a general way the Structural trade is quiet, but some fairly large contracts have recently been placed. The McClintic-Marshall Construction Company has taken about 4000 tons of bridge work and track elevation for Chicago and western Indiana, and about 1500 tons of Building Material for the Pennsylvania Company, in addition to some large Steel buildings. We quote: Beams and Channels, up to 15-inch, 1.50c.; over 15-inch, 1.60c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.50c.; Angles, 8 x 8 and 7 x 3½ inches, 1.60c.; Zees, 3-inch and larger, 1.50c.; Tees, 3-inch and larger, 1.55c. Under the Steel Bar Card Angles, Channels and Tees under 3-inch are 1.50c., base, for Bessemer, and 1.55c., base, for Open Hearth, subject to half extras on the Standard Steel Bar Card.

Plates.—There is nothing of special interest to note in the Plate market, new tonnage being fairly large, while specifications on contracts are coming in very freely, giving the mills plenty of work. The Steel car interests are buying Plates and other Shapes more freely, the Standard Steel Car Company turning out at the present time 48 Steel cars per day, for which it uses about 600 tons of Plates and Shapes, all of which are furnished by local mills. There is some talk of an advance in price of Plates and an early meeting of the Plate Association to take action on this, but so far nothing official on this has been given out. Prices are unchanged and we quote: Tank Plate, ¼-inch thick, 6¼ to 14 inches wide, 1.40c., base; over 14 inches wide and up to 100 inches in width, 1.50c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05

Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—While new tonnage in Sheets is not quite as heavy as some time ago, buyers are specifying very freely on contracts and the leading mills are being pushed to their utmost to get out Sheets as fast as wanted. Some of the leading Western jobbers who expected to have heavy stocks of Sheets for spring trade find these depleted and are urging prompt shipment from the mills to keep their stocks intact. Announcement of an advance in price of Sheets by the leading interest within a short time would not be a surprise to the trade, but, in fact, is generally expected. Prices remain very firm and we quote: No. 24, box annealed, one pass through cold rolls, 2.05c.; No. 26, 2.15c.; No. 27, 2.20c., and No. 28, 2.30c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.75c.; Nos. 25 and 26, 2.95c.; No. 27, 3.13c.; No. 28, 3.35c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $2.85 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—The tonnage in both Iron and Steel Bars continues quite heavy, and this, with large contracts placed some time ago on which buyers are specifying very freely, is giving the mills a full amount of work, and, in fact, some of the leading mills rolling Steel Bars are from four to six weeks behind in shipments. We quote Common Iron Bars at 1.65c. to 1.70c. and Refined Iron Bars at 1.80c. to 1.85c., Pittsburgh. We quote Bessemer and Open Hearth Steel Bars at 1.40c., base, in carloads and larger lots, with the usual advances for small lots.

Hoops and Bands.—New tonnage being placed in Hoops and Bands is rather light, the leading consumers being covered by contracts placed some time ago, when prices were from $2 to $3 a ton lower than they are now, and on which they are specifying very freely. On the few orders now being placed for Hoops the three leading producers quote 1.55c., and on Bands, 1.40c., base, extras on the latter as per Steel card, f.o.b. cars, maker's mill.

Tin Plate.—Reports that orders for Tin Plate had fallen off and that the leading mills are piling up stock are vigorously denied. It is stated that the output of the leading Tin Plate mills is being shipped to consumers about as fast as made and that new orders are quite heavy. As noted in this report before, mills that can make prompt shipment of Tin Plate are sometimes able to secure a premium of 5c. to 10c. a box over the official price. We quote 100-lb. Cokes at $3.50 net, f.o.b. Pittsburgh, terms 30 days or 2 per cent. off for cash in ten days.

Merchant Pipe.—Conditions in the Pipe trade are very satisfactory, demand being heavy and the mills filled up with tonnage for some time to come. A good deal of large work in the way of Line Pipe is in sight and the outlook for the Pipe trade could hardly be more satisfactory. Prices are firm, discounts to consumers in carloads being as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛ and ¼ inch	68	52	66	50
⅜ and ½ inch	72	60	70	58
¾ to 6 inches	76	66	74½	64½
7 to 12 inches	71	56	69½	54
Extra strong, plain ends, ⅛ to ⅜ inch	61	49	59	47
½ to 4 inches	68	56	66	54
4½ to 8 inches	64	52	62	50
Double extra strong, plain ends, ⅛ to 8 inches	57	46	55	44

Boiler Tubes.—The demand for Boiler Tubes continues active and the leading mills are shipping their product about as fast as made. Some of the leading consumers anticipated the recent advance by placing large contracts, on which they are now specifying. Discounts in carloads are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ inches	43	46
1¾ to 2¼ inches	43	58
2½ inches	48	60
2¾ to 5 inches	55	66
6 to 13 inches	43	58

Merchant Steel.—The new tonnage being placed with the mills is light, most of the leading consumers being covered by contracts, some of which run up to July 1 or longer, and on which they are specifying very freely. Prices are fairly firm and we quote: Tire Steel, 1.60c. to 1.65c.; Smooth Finished Machinery Steel, 1.60c.; Open Hearth Spring Steel, 2c. to 2.10c.; Toe Calk, 1.90c. to 2c.; Colled Rolled Shafting is 52 per cent. off in carloads and 47 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand for Spikes continues heavy, one or two local producers being sold up for several months ahead. We quote $1.65 to $1.70 per 100 lbs. in carloads and $1.75 in less than carloads, f.o.b. Pittsburgh.

Spelter.—Prices on Spelter are easier and the market is very quiet. We quote prime Western grades at 6.05c., St. Louis, equal to 6.17½c., Pittsburgh. On a firm offer this price might be shaded.

Connellsville Coke.—We note a continued heavy demand for both Furnace and Foundry Coke, and as the car supply is better than for some time, shipments are correspondingly heavy, amounting to 12,744 cars last week. It is stated that the Lackawanna Steel Company is trying to secure a permanent supply of Coke in the Connellsville region and has made offers for several properties. The Republic Iron & Steel Company will build 400 more Coke ovens this summer, the Brier Hill Coal & Coke Company 200 and the Orient Coal & Coke Company 100. Other Coke concerns will probably build new ovens, and this year promises to be a busy one in the matter of erecting new ovens. The H. C. Frick Coke Company is negotiating for the purchase of the holdings of the Hecla Coke Company, amounting to 1100 Coke ovens and 5000 acres of Coal lands. These Coal lands are held under lease by the Hecla Coke Company from the Thaw estate, the Hecla Company paying the Thaw estate a royalty on every ton of Coke produced. Out of 29,129 ovens in the Upper and Lower Connellsville regions only 1729 were idle last week, the output of Coke for both regions having been a little over 330,000 tons. Furnace Coke for prompt shipment is more plentiful and is held at $2.50 and $2.75 a ton at oven. Strictly Connellsville 72-hour Foundry Coke is held at $2.50 to $2.75 a ton on contract.

Iron and Steel Scrap.—The Scrap trade continues quiet and prices are slightly easier, owing to lack of demand and to the weaker tone in the Pig Iron market. There have been no important sales of Scrap in this district since our last report. We quote: Heavy Melting Scrap, $16 to $16.50; No. 1 Wrought Scrap, $19.50 to $20; Bundled Sheet Scrap, $14.50 to $15; Cast Iron Borings, $10.50 to $11; Wrought Iron Turnings, $13.75 to $14; Steel Rails, short pieces, $16 to $16.50; No. 1 Cast Scrap, $15.50 to $16; Iron Car Axles, $23 to $24. All above prices are for gross tons, f.o.b. Pittsburgh. On a firm offer and for prompt shipment it is probable some Scrap dealers would slightly shade above prices.

The Pittsburgh Foundrymen's Association.—The regular monthly meeting of this association was held in Pittsburgh February 6, with W. H. McFadden in the chair and F. H. Zimmers secretary. Owing to inclement weather the attendance was lighter than usual, among those present being the following: E. D. Frohman, S. Obermayer Company; J. W. Anderson and S. F. Warren, Pennsylvania Malleable Company; J. H. Murray and T. J. Dewan, Duquesne Steel Foundry; W. H. McFadden and H. E. Field, Mackintosh, Hemphill & Co.; S. D. Sleeth and John Schick, Westinghouse Air Brake Company; W. P. Reardon and B. B. Fuller, Westinghouse Electric & Mfg. Company; L. G. Blunt, Westinghouse Foundry; J. S. Seaman, Seaman-Sleeth Company; Robert A. Walker, *The Iron Age;* John McLaren, Phillips & McLaren; George S. Page, Park Works of Crucible Steel Company, and F. H. Zimmers, Union Foundry & Machine Company. The paper of the evening, entitled "Core Binders," was read by J. S. Robeson, president of the American Glutrose Company, Philadelphia. Its reading was followed by an interesting discussion.

The Lackawanna Steel Company, which has recently taken from the Illinois Steel Company C. H. McCullough, Jr., to be assistant to the president, and Thomas Mathias to be the assistant superintendent at the Buffalo works, has just added to this list George Downs, general night superintendent; William Sutherland, night superintendent, and Jeremiah Sullivan, assistant superintendent of the rail mill, all of whom have left the South Chicago works and gone to Buffalo.

A. A. Fowler of Rogers, Brown & Co., New York, has completely recovered from an operation which he underwent some weeks since.

The Machinery Trade.

NEW YORK, February 8, 1905.

So far as large business is concerned, the week has not only shown a continuance of the good volume which has recently been in evidence, but has marked a considerable increase. The large machinery houses are showing a good deal of enthusiasm over the bright prospects in sight and the present conditions. As to the smaller run of trade there is a bit of dissatisfaction, however. Orders have been a little more backward this week, and many complaints are heard concerning the serious delays in shipping incidental to the snowstorm. Machine tool merchants are still complaining about the lathe manufacturers' inability to make shipments with any degree of promptness.

As a rule, prices remain unchanged. There has come over the heavy machinery market a degree of firmness, however, which it is taken in some quarters foreshadows an increase in prices.

The tubular boiler trade is still in rather poor shape, and prices are somewhat demoralized. We know of a concern which has everything in readiness for placing upon the market a new line of boilers, but is withholding it pending an improvement in this particular branch of the trade.

Architects and engineers in this city are extremely busy preparing plans for contemplated structures of large dimensions, which if unhampered by labor disturbances will be constructed in the spring and will require considerable mechanical equipment.

Remarkable Work of New Chuck Lathe.

Somewhat startling results of tests of a new driving wheel chuck lathe, just placed on the market by the Niles-Bement-Pond Company, have occasioned considerable comment in machine tool and railway shop circles. The machine which showed the remarkable results was installed in the Montreal shop of the Canadian Pacific Railway a short time ago. In its construction it is said to embody entirely new features for a machine for this class of work, and the results obtained seem to amply justify the radical departure taken in the design. We understand that this one machine has been performing work at the rate of six pairs of 79-inch wheels in a day of 10 hours, which is a little more than three times the amount of work formerly performed on a driving wheel lathe of this company. The story, as it is told in the trade, is that the Canadian Pacific interests, who had three driving wheel lathes at their Montreal shop, needed another one and installed this new machine. The capacity for work is so great that it is now doing the work of the entire shop. We understand that the principle of construction of this machine embodies two pairs of face plates, each wheel being gripped at the tires between a pair of the same. In this manner the work is held at a point very close to the point of contact of the tool, so that the amount of cut is only limited by the endurance of the tool steel used, the element of the springing of the axle being eliminated entirely.

Consolidation of Pneumatic Tool Companies.

There is a strong probability that within the very near future the Philadelphia Pneumatic Tool Company will be absorbed by the Chicago Pneumatic Tool Company. Negotiations to this end are now under way, and while the exact basis of consolidation has not as yet been agreed upon, we are informed on very good authority that matters are progressing favorably and the combination will soon be effected. It is stated, in fact, that there is a possibility that the control of the Philadelphia company will simply be taken over by the principals interested in the Chicago company and that the two companies will be operated as at present. We know that for some time past there has been a movement on foot looking toward increasing the capitalization of the Philadelphia company from $100,000 to $1,000,000 and the addition of two new members to the board. These negotiations give rise to the supposition that the Philadelphia company may continue to operate separately.

Large Machinery Purchases.

Doubtless the largest purchaser of machine tools during the last week was the American Locomotive Company, which placed an order for $145,000 worth of miscellaneous shop tools with the Niles-Bement-Pond Company. A number of large boring mills, frame slotters and milling machines were included in these orders. The company also placed an order for a very large number of assorted tools with Manning, Maxwell & Moore. The tools are to be placed in the Schenectady and Dunkirk shops.

The Missouri-Pacific Railway has placed a large order for general railroad tools, to be installed in new shops at Sedalia, Mo., with Manning, Maxwell & Moore, who also received a large order for boring mills, steam hammers, lathes, &c., to be installed in the shops of the Central Railroad of New Jersey, at Eliabethport, N. J., and Ashley, Pa.

The New York Air Brake Company, Watertown, N. Y., has been in the market with a very good sized list of machine tools of different types, and we understand that the orders have been placed with Manning, Maxwell & Moore.

Important Machinery Inquiries.

The General Electric Company, which, as we noted last week, is in the market for quite a large number of machine tools, has not yet placed its orders. We understand that these tools are to be used in the new static transformer department and consist chiefly of the lighter classes of machinery.

There has been a report current in the trade during the week to the effect that the Chesapeake & Ohio Railway Company intends erecting large locomotive shops at Richmond and Huntington. George W. Stevens, president of the company, advises us that this statement is incorrect. In the machinery trade we learn that specifications were issued some time ago for a considerable quantity of machinery to be installed at these points, and while bids were received, nothing has come of the matter as yet.

Those of the trade who have successfully followed up the machinery requirements of the Standard Roller Bearing Company, Philadelphia, Pa., announced in these columns from time to time, have been rewarded with some nice orders. Thus very recent purchases include 15 Brown & Sharpe plain and universal grinders, 20 Cleveland automatic machines, five semiautomatic machines, ten lathes, three Cincinnati milling machines, 12 upright drills and a number of small tools.

It will be remembered that the Standard Roller Bearing Company is making very extensive additions to its works and its needs in the way of mechanical equipment have not yet been supplied. One of the additions to the plant is to be used as a steel foundry, and the company will shortly be in the market for a complete steel casting equipment, including furnaces, &c. We are informed that the company also expects to purchase within the next three months five lathes, ranging from 14 to 24 inches; two milling machines, two splining or broaching machines and ten universal grinders.

Expenditures aggregating about $25,000, of which $16,000 represents new machinery, have been authorized by the Board of Directors of the Old Dominion Iron & Nail Works Company, Richmond, Va., for making improvements to the plant. Some of the mechanical equipment to be purchased are two 150 horse-power boilers, a 12-inch Belgian train of rolls, two spike machines, one lathe and two waste heat furnaces. A few months ago Frank J. Gould of New York purchased the Old Dominion works and immediately commenced the preparation of plans for remodeling and modernizing the plant with the intention of putting it in operation as soon as possible. These plans, which have now been approved, provide for the erection of a 9-inch mill and building and for the installation of a department for the manufacture of spikes, which is a new venture for the company, but which promises to become an important adjunct to its business, as Mr. Gould controls several railroad properties in and around Richmond, besides holding important interests in other large railroad systems. Beginning the first of the year all departments of the works were put into full operation with a full force of men, the first time in many months.

Drills, power hammers, cold tire setters, hub boxing machines, blacksmith tools and wood working machinery, consisting of planers, jointers, band saws, cut off saws and swing saws are required by the McKay Carriage Company, Grove City, Pa., which is to rebuild its plant, which was recently destroyed by fire. None of the machinery has been purchased. The company is to rebuild on the old site, replacing the burned structures possibly with a cement block building, 100 feet square, two stories high, and another two-story building 50 feet square. While it has not yet been definitely settled, it is probable that a gas engine will be used to furnish power, though the company has been figuring some on electric power.

We are advised by W. P. Coleman, president of the Canada Car Company, Limited, Board of Trade Building, Montreal, that contracts for very extensive machinery equipment required by this company have not yet been placed. The matter is being put into shape as rapidly as possible, however, and it is expected will soon be settled.

The Fred W. Wolf Company, which has probably the largest machine shop in Chicago that does none of its own foundry work, has about concluded to make its own castings, and desires literature and prices on the necessary equipment and material for the installation of a complete foundry plant. The company contemplates establishing its foundry out in the

country on a location suitable and large enough to move its entire plant on it. This change will be made gradually so as not to interfere with the company's work.

The Temple Iron Company, Reading, Pa., will prepare plans, and will soon call for bids for the construction of a new breaker at its Harry E. colliery. The new breaker will cost about $150,000, and will have a daily capacity of about 2000 tons of coal.

The D. B. Martin Company, Philadelphia, Pa., has purchased the Easter abattoir in Montreal, Canada, and will spend considerable money in enlarging and modernizing the plant. The improvements have not yet been definitely decided, but in the near future the company intends to install quite a little new machinery.

Two contracts for building portions of the $100,000,000 Barge Canal have been awarded by Superintendent of Public Works Franchot, Albany, N. Y., to Lindon W. Bates, 74 Broadway, New York. The first contract is for work on the Champlain Canal, and calls for the expenditure of $605,008, while the second contract, which is for work on the Erie Canal, was awarded to Mr. Bates at his bid of $726,815. These awards were made on item prices or the unit system, instead of the lump sum basis. This leaves four of the six pieces of work which were advertised to be contracted for.

The New Jersey Boiler Company, successor to the Bard-Cate Company, 97 Liberty street, New York, is now making large additions to its plant at Boonton, N. J., and it has just closed contracts with Joseph T. Ryerson & Son of Chicago and New York. A number of punches, shears, rolls, riveters, &c., are to be used in the making of heavy riveted steel pipe. The New Jersey Boiler Company has an order for 1800 tons of riveted steel pipe, to be used for sewerage purposes by the municipality of Jersey City, N. J. The pipe runs from 5 to 8 feet in diameter, to be made up of plates ½ inch thick, ranging from 75 x 170 inches to 75 x 380 inches. The plates are now being shipped from Pittsburgh. The company is at present directing almost all of its energy in the direction of steel plate work, but intends in the very near future to place upon the market a line of high class boilers. Mr. Bard, who is the senior member of the company, is well known in the trade in this district, as well as the vicinity of Pittsburgh and the West, through his former connections with Riter-Conley Mfg. Company of Pittsburgh.

As soon as the weather will permit, work of construction will be commenced on another iron works in Hoboken, N. J. The Thomas J. Marsh Iron Works Company of that city, which has contracts for several large steel structures in New York, is to erect a plant 100 x 125 feet, on Park avenue. The foundations for the building have been laid and if the weather shall prove favorable it is the intention to push the work as fast as possible so as to have the plant ready for operation March 1.

Arthur Kayser, 24 Alte, Jacobstrasse, Berlin, S. W., who is the selling agent throughout Europe with the exception of England and France for the automatic reverse tapping chucks and automatic opening die chucks manufactured by F. A. Errington, 39 Cortlandt street, New York, is now in this country. He is making his headquarters at Mr. Errington's office and expects to remain here about three or four weeks. The object of Mr. Kayser's trip is to widen his business connections and secure the European agency for some additional mechanical specialties kindred to those which he is now handling. He will travel through New England and west as far as Pittsburgh in search of such specialties.

New Smelting Plants Projected.

We have received further information concerning the contemplated improvements of the American Smelting & Refining Company, whose principal offices are located at 71 Broadway. The improvements as planned for the coming year are on an extremely large scale, and if carried out as expected will involve the expenditure of several million dollars. It has been definitely decided to build one large new smelting plant in Northern Mexico, plans for which are now being prepared. Another large new smelting plant, also to be located in Northern Mexico, is also projected, and work upon the plans will doubtless be commenced within a short time. In Utah it is contemplated to erect a large copper smelting plant, and it is also expected in the trade that this project will soon assume definite shape. It has also been definitely decided to gradually increase the capacity of the company's refineries at Perth Amboy, N. J. Plans for this work are under way at the present time. These matters are scarcely in shape for the specification of any of the equipment required, but it is expected that within four or five weeks the work will have arrived at this stage.

The McClintic-Marshall Construction Company, with works at Pittsburgh and Pottstown, Pa., recently shipped four large girders for use in the Majestic Theater Building, Chicago. These girders were 73 inches deep, 41 feet 2 inches long and weighed about 55 tons each. They are among the largest girders ever turned out in this country.

New England Machinery Market.

WORCESTER, MASS., February 7, 1905.

There have been no changes in the condition of the machinery market in New England States during the past week. Business continues to be good. No one is complaining. The prospect of a first-rate, normal demand for tools of all descriptions continues everywhere, and many manufacturers and dealers expect something better than normal, though all agree that they will be, on the whole, better satisfied with a demand rather less than that of the recent boom, but more protracted. The recent storms have delayed freight shipments, which is causing some annoyance to customers as well as to manufacturers who have tools to send out.

At least one New England machine tool company has received an offer from Alfred H. Schutte for the tools on exhibition at the Brussels exposition, the offer being 30 per cent. off. It is understood that Mr. Schutte has made this offer pretty generally, and it is being accepted.

New Works.

The Bristol Specialty Company, Bristol, Conn., is to build an entirely new plant at Terryville, Conn., which will give very much enlarged quarters. The company has recently absorbed the metal specialty business of Hanson Bros., Plainville, Conn., and the wooden specialty business of W. H. Scott & Co., Terryville, and the new plant will be on the site of the factory of Scott & Co., which was destroyed by fire not long ago. The plans call for a two-story building, 33 x 147 feet, with a one-story wing, 32 feet square; a saw mill, 50 x 100 feet, and a japanning and varnishing building, 20 x 40 feet. There will be storage buildings for lumber, &c. It is expected that the plant will be ready for occupancy the middle of May. Considerable new machinery will be required, but the company states that it will not be in the market for machinery before May.

Johnson & Bassett, manufacturers of woolen machinery, Worcester, Mass., have bought 2 acres of land on the Boston & Albany Railroad, adjoining the plant of the Rice, Barton & Fales Machine & Iron Company, and plan to erect large shops upon the property, which will greatly increase their manufacturing facilities. The land has 500 feet frontage on the railroad. Work cannot begin on the shops until the question of abolition of the city's grade crossing has been settled. The tracks will be very considerably elevated, but until the exact plans are known the details of the buildings cannot be fully decided. If the matter is decided this season, as is possible, then the building will be done at once.

Work on one wing of the new plant of the Knox Motor Truck Company, Springfield, Mass., has begun, and it will be ready for occupancy in a few weeks. The plans call for a building forming three sides of a square, and an ell at the front of one wing partly closes the fourth side. The one side which is being built will be 50 x 200 feet, two stories at the front and three at the rear, the slope of the land making a full well lighted story of the basement for a considerable distance. The ell at the front will be 30 feet square, the entire front, ell and main building being intended for the offices. In the summer the rear side of the square will be built, adding 100 feet to the extent of that side, which will be three stories the entire length. The third side will be built when business shall demand it.

Some Machinery Requirements.

The Morgan Silver Plate Company, Winsted, Conn., is to erect a three-story brick addition, 30 x 50 feet, which will have boiler room, casting room and plating equipment. The company will remove its present casting and plating departments to the new building, and will need only such new equipment as is not already included in the plant. A new 40 or 50 horse-power horizontal boiler will probably be installed, but no engine nor power transmission.

The Simplex Mfg. Company, Hartford, Conn., will be in the market for machinery and tools for the manufacture of envelope sealing machines, postage stamp separating machines, combination filing and jig saw, with magazine saw for die and jig work, and a safety device for range boilers to prevent the bursting of water fronts. Circulars are requested to be sent to Charles J. Fancher, Granby, Conn. The company has just been incorporated in Connecticut.

The Washburn shops of the Worcester Polytechnic Institute, Worcester, Mass., have received an order for ten drill grinders for St. Petersburg.

The Hopkinson Machine Company, Springfield, Mass., is getting out a new bench sensitive drilling machine, which will be ready for the market in a short time.

At the annual meeting of the stockholders of the Chapman Valve Mfg. Company, Indian Orchard, Mass., held last week, Superintendent C. J. Winther resigned as a member of the Board of Directors and was succeeded by George B. Holbrook. Edwin McElwain was elected a director to fill the vacancy caused by the death of Julius H. Appleton. The following officers were elected: President, James D. Safford; clerk and treasurer, H. R. Dalton, Jr.

The Philadelphia Machinery Market.

PHILADELPHIA, February 7, 1905.

Unfavorable weather conditions continue to exert a depressing effect on the machinery trade in this territory. Buyer and seller find it difficult to get in close communication and several fair orders which were expected to be closed up during the past week have been temporarily withheld. Considering conditions, the volume of business transacted has been fairly good and gives encouragement for the future. In several lines the demand has been a little irregular, some dealers have closed a nice lot of business, while others have done comparatively little. No specifications of any size have developed recently, but there has been an improvement in inquiries for small lots of tools from various sources. Outside work, building construction, &c., has been almost entirely held up during the week and business depending on such operations is consequently delayed. The various railroads are preparing to get into the market with specifications for tools, both for renewal and new equipment; opinions differ, however, as to just when their requirements will be known.

The smaller manufacturers of machinery and tools are probably a shade more busy, but there is still room for improvement in many lines. The boiler and engine trade is more or less inactive, while builders of traveling cranes have taken on more business and shops are being run pretty full. The foundry trade has also improved to a slight extent.

Enlarging Capacity for Special Lines.

Dienelt & Eisenhardt, Incorporated, have purchased the patterns, tools and materials on hand of the Quaker City Electric Company of Philadelphia, and will engage in the manufacture of motors and general electric equipment for driving tools and machinery. A number of orders have already been taken and they will enlarge their capacity as the demand increases. They also report a material increase in the demand for hydraulic jacks, principally from the various railroads. An improvement is also to be noted both in their machine and foundry department.

Pedrick & Smith, builders of special tools and general machinists, will remove from their present location, Girard avenue and Schakamaxon street, to 254 Church street, Germantown, Philadelphia, where they have secured a building which will enable them to double their present capacity. Quite a lot of additional machinery will be needed to equip their new plant; the order for machine tools, however, has already been placed, while that for their other needs has as yet not been decided upon. These parties recently took an order for a large number of rock drills from the Gasoline Rock Drill Company, for the manufacture of which they are especially equipping their new plant.

General Machinery Notes.

The John Wood Mfg. Company, Conshohocken, Pa., has let the contract for an extension to its plant at that point. The building will be of brick and iron, one story high, and 60 x 120 feet. Plans have not progressed far enough to tell what equipment will be needed in the machinery line, but the company does not anticipate that it will be much beyond power transmission machinery.

Bids have been received by Director Costello of the Department of Public Works, of the city of Philadelphia, for a hoisting and transporting system of machinery, for the Lardners Point Pumping Station. The bids range from $60,000 to $80,000, and each bidder submitted his own plans. Contracts have not yet been awarded.

Kurtz & Gift, general machinists, Allentown, Pa., are adding equipment to their new plant in that city from time to time. At present they are in the market for a new lathe, about 14 inches by 8 feet.

Manning, Maxwell & Moore have taken the contract through their Philadelphia branch to furnish the full equipment of the machine shops, consisting of a general line of tools, for the United States battle ship Kansas and the cruiser Washington, building at the yards of the New York Shipbuilding Company, Camden, N. J. Some other orders of fair size were taken by them last week, including the tool equipment for the new shops of Pedrick & Smith, in this city.

The enormous demand for furnace and foundry coke which has been prevailing for some months, as shown by the fact that while practically all the available ovens in the Connellsville region are in blast they are unable to meet this demand, will undoubtedly result in a large number of coke ovens being built during this year. The Brier Hill Coal & Coke Company, which is owned by the Brier Hill Iron & Coal Company of Youngstown, Ohio, will build 200 more ovens. The Orient Coal & Coke Company, which is owned by several blast furnace interests in the Mahoning Valley, will also build 100 additional ovens.

Cincinnati Machinery Market.

CINCINNATI, OHIO, February 7, 1905.

A careful search among the machine tool interests of the city failed to discover any special items of interest that had materialized during the past week. The general feeling seems to be one of satisfaction, trade conditions being about normal. The demand in a foreign way is very strong and gradually increasing. The demand from Japan has heretofore been mostly in the line of lathes of varied sizes, to the exclusion of other tools. We now learn that specifications are being prepared for an assortment of shapers and that they will soon be in the market for this tool, as well as several others. Russia also is gradually coming forward and a number of inquiries are abroad for several descriptions of tools for shipment to that country. One local firm during the week shipped six shapers to St. Petersburg, presumably for Government use. The molders' strike is still felt in different ways, one lathe builder advising that it was compelled to send to distant points to secure castings, thus causing much inconvenience, expense and unnecessary delay. The Industrial Bureau of this city, of which William Lodge of the Lodge & Shipley Machine Tool Company is the newly elected president, has in contemplation the locating of a large iron and steel mill here, and the right kind of a proposition with a competent executive can secure large financial assistance.

New Companies.

A new concern known as the Ahrens Fire Engine Company has been incorporated at Columbus. Stock to the amount of $100,000 has been subscribed and the following officers elected: G. F. Ahrens, president; Charles Fox, vice-president, and George W. Krapp, secretary and treasurer. The company now has a building under course of construction at the corner of Alfred and Cook streets, which will be three stories in hight, 98 x 118 feet, with a floor space of about 35,000 square feet. It expects to occupy the new plant about May 1. The building and equipment will cost about $70,000.

The Elmore Furnace Company of Elmore, Ohio, has been incorporated with $20,000 capital. The company will conduct a foundry and machine shop.

The Metallic Vault Company, Galion, Ohio, has been incorporated and will lease the old gear works for its use. Thomas Kelly and George Martin form a committee appointed to prepare a list of machinery and tools necessary and get prices on same.

Notes.

The Moulton Wireless Umbrella factory of Plain City, Ohio, has increased its capital to $50,000, and will install new machinery and a 150 horse-power engine.

The Portsmouth Steel Company, Portsmouth, Ohio, is making extensive improvements to its plant.

The Cincinnati Punch & Shear Company says that business just at present is somewhat dull. During January it experienced quite a small boom, and had all that it could do. During that time the company made a shipment of a 48-inch motor driven boiler punch 12 feet long and weighing 30,000 pounds, to the National Tehuantepec Railway Company. This machine was for bending locomotive boiler iron.

The Bradford Machine Tool Company is working overtime, and is among the busy firms of the city. It is in receipt of orders from abroad both of private and Government contract, and has made some heavy shipments covering these orders during the past month.

The John Steptoe Shaper Company made a shipment of ten shapers for the Navy Department of the Belgium Government, and also several machines to St. Petersburg. It reports a good foreign demand, and also a healthy domestic inquiry.

The annual meeting of the stockholders of the Wheeling Mold & Foundry Company was recently held in Wheeling, W. Va., and a very satisfactory report of the business for the past year was read. This company is making regular deliveries on its contract for 65,000 tons of castings for the Pennsylvania Railroad tunnel. Officers were re-elected, as follows: Charles E. Blue, president; L. V. Blue, vice-president, and Charles C. Woods, secretary.

The bonus of $250,000 offered by the city of Sydney, Cape Breton, Canada, two years ago to any company which will start a shipbuilding industry in the city within three years is being sought by a company recently formed, which not only intends to erect a shipbuilding plant, but will also build a floating dry dock which will hold an 8000-ton vessel, and keep a wrecking steamer stationed at the port. The company guarantees to spend $1,000,000 before the bonus is claimed.

Government Purchases.

WASHINGTON, D. C., February 7, 1905.

Under the new system recently adopted by the Navy Department assigning to the naval pay offices the purchase of considerable amounts of supplies outside of what might strictly be regarded as emergency requirements, the work of the Bureau of Supplies and Accounts is gradually being reduced to its former volume. The opening of bids to-day, however, including machine tools for a number of yards, was not concluded in time for the results to be presented in this correspondence. It is probable that hereafter the quantity of miscellaneous supplies purchased by this bureau will be much less, which will enable the officials to conclude the regular Tuesday opening at a single session.

The Isthmian Canal Commission, Washington, will receive bids until February 28 for 25 pneumatic rock drills, three sets of blacksmiths' tools for making bits, three sets of blacksmiths' tools for making shanks and 25 extra steam heads for drills.

The following bids were opened to-day, February 7, for machine tools, &c., for the Isthmian Canal Commission:

Bidder 4, Handlan Buck Mfg. Company, St. Louis; 7, Baird Mfg. Company, Pittsburgh, Pa.; 8, J. Jacob Shannon Company, Philadelphia; 10, H. A. Rodgers & Co., New York; 11, Gibbons & Stream, New Orleans; 16, H. B. Underwood & Co., Philadelphia; 24, David B. Hayes, New York; 30, J. W. Cregar Agency, New York; 32, Motley Green Company, New York; 34, Gouden Mfg. Company, Chicago; 39, Belknap Hardware Company, Louisville; 44, Merrill Mfg. Company, Toledo; 45, Ingersoll-Sergeant Drill Company, New York; 47, Fox Bros. Company, New York; 48, David R. Dunn Gordon Company, Cincinnati; 49, William Sellers Company, Philadelphia; 52, Montgomery & Co., New York; 55, Prentiss Tool & Supply Company, New York; 56, James McCabe, New York; 57, William Wirt Clark & Sons, Baltimore; 58, Niles-Bement-Pond Company, New York; 59, Bradford Machine Tool Company, Cincinnati; 60, Fairbanks Company, Chicago; 61, Becker, Brainard Company, Hyde Park, Mass.; 62, Rand Drill Company, New York; 65, Manning, Maxwell & Moore, New York; 66, Robert Car & Wheel Company, Three Rivers, Mich.

Class 11. One lot hand cars—Bidder 8, $1292.80; 10, $1292.07; 32, $1160.25; 34, $924.85; 39, informal; 47, $1128.08; 52, $1063.60; 60, $952.80; 65, $1296.48; 66, $882.59.

Class 12. Three 600-pound steam hammers—Bidder 7, $1845; 10, $2250; 24, $1920; 47, $1962.73; 49, $2235; 55, $2085; 57, $2595; 58, 2106; 65, $2475.

Class 13. Ten engine lathes—Bidder 7, $1205; 11, $3227; 47, informal; 55, informal; 58, $1148; 59, informal; 65, $2470.89.

Class 14. Two 42-inch planers—Bidder 4, $2080; 7, $2744; 24, $3450; 30, $3530; 47, $3318; 55, $3100; 56, $3900; 58, $3668; 65, $4263.44.

Class 15. Two universal milling machines—Bidder 4, $1740; 30, $695; 47, $1249.98; 58, $1896; 61, $1341; 65, $1148.74.

Class 16. One car wheel boring machine, Niles design—Bidder 49, $1865; 58, $1500; 65, $1339.

Class 17. One driving wheel press for wheel 60 inches diameter—Bidder 7, $1268; 49, $1570; 58, $1034; 65, $1310.58.

Class 18. One No. 4-E universal trimmer—Bidder 4, $50; 7, $47; 47, $49.22; 55, $48; 58, $51; 65, $49.79.

Class 19. One Acme 2-inch triple bolt cutter and two Acme double bolt cutters—Bidder 7, $2226; 10, $2135; 30, $2213.50; 47, $2002.14; 55, $2275; 58, $2288; 65, $2310.74.

Class 20. One Acme 2-inch 4-spindle nut tapper—Bidder 4, $485; 7, $480; 30, $485; 47, $538.87; 55, $498; 58, $495; 65, $512.50.

Class 21. One Acme bolt header—Bidder 4, $2130; 7, $2149; 10, $1968; 30, $2075; 47, $1991; 55, $2315; 58, $2198; 65, $2181.85.

Class 22. Three No. 1 wet emery grinders—Bidder 4, $780; 7, $318; 10, $348; 30, $2225; 47, $312; 58, $330; 65, $315.15.

Class 23. One No. 5 pipe threading machine—Bidder 4, $880; 10, $810; 30, $720; 44, $750; 47, $827.75; 58, $793; 65, $832.15.

Class 24. Three twist drill grinders—Bidder 4, $354; 30, $351; 47, $315; 65, $336.

Class 25. One portable cylinder borer—Bidder 4, $207; 7, $298; 16, $300; 47, $189; 58, $250; 65, $277.50.

Class 26. One 51-inch boring mill—Bidder 30, $1950; 47, $1596; 55, $1880; 58, $1673; 65, $1854.38.

Class 27. One automatic railway cut off saw—Bidder 4, $435; 7, $399; 10, $270; 30, $267.50; 47, $399; 55, $414; 58, $443; 65, $398.

Class 28. One Rand Imperial type 10 air compressor and fittings—Bidder 4, $6670.80; 11, $7945.75; 45, $7252.09; 48, $6525.55; 62, $7184.27. W. L. C.

The following bids were opened January 24 for supplies for the various navy yards:

Bidder 9, Aumen Machinery & Supply Company, Baltimore, Md.; 12, Brown & Sharpe Mfg. Company, Providence, R. I.; 23, Thomas W. Byrne, Boston, Mass.; 33, Burke Electric Company, Erie, Pa.; 36, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 37, Baker & Hamilton, San Francisco, Cal.; 46, Caldwell Bros., Seattle, Wash.; 49, Emil Caiman, New York; 58, Crocker-Wheeler Company, Ampere, N. J.; 59, C. & C. Electric Company, New York; 60, Chicago Pneumatic Tool Company, New York; 68, Thomas Carlin's Sons Company, Allegheny, Pa.; 73, P. F. Dundon's Iron Works, San Francisco, Cal.; 74, J. D. Dickson, Newport, R. I.; 76, Geo. Dow Pumping Engine Company, San Francisco, Cal; 77, Thomas H. Dallet Company, Philadelphia, Pa.; 82, Drew Machinery Agency, Manchester, N. H.; 105, Fairbanks Company, New York; 107, Fosdick Machine Tool Company, Cincinnati, Ohio; 113, Globe Engineering Company, San Francisco, Cal.; 114, Arthur Famwell, Blaine, Wash.; 118, Garvin Machine Company, New York; 119, Richard W Geldhart, New York; 120, General Electric Company, Schenectady, N. Y.; 126, Halliday-Henshaw-Buckley Company, Seattle, Wash.; 130, M. W. Hill, Baltimore, Md.; 131, Henshaw, Buckley & Co., San Francisco, Cal.; 136, Holtzer-Cabot Electric Company, Brookline, Mass.; 138, H. E. Holmes, San Francisco, Cal.; 140, Handlan-Buck Mfg. Company, St. Louis, Mo.; 143, Harron, Rickard & McCone, San Francisco, Cal.; 144, Edward W. Irwin, New York; 145, Ingersoll-Sergeant Drill Company, New York; 165, Laidlaw-Dunn-Gordon Company, New York; 166, N. B. Livermore, San Francisco, Cal.; 170, Leavitt Machine Company, Orange, Mass.; 175, McHelvey Concrete Machinery Company, Chicago, Ill.; 179, Municipal Engineering & Contracting Company, Chicago, Ill.; 188, Montgomery & Co., New York; 189, Manning, Maxwell & Moore, New York; 190, Maryland Equipment Supply Company, Baltimore, Md.; 199, McCay Engineering Company, Baltimore, Md.; 201, Niles-Bement-Pond Company, New York; 206, National Concrete Machinery Company, Chicago, Ill.; 215, Plummer Electric Company, Boston, Mass.; 226, Portland Company, Portland, Maine; 232, J. B. Roache, New York; 248, Rand Drill Company, New York; 258, Sherman, Brown, Clements Company, New York; 263, Southern Electric Company, Baltimore, Md.; 267, Smith-Courtney Company, Richmond, Va.; 268, Sprague Electric Company, New York; 272, Seannevin & Potter, Newport, R. I.; 277, Tatum & Bowen, San Francisco, Cal.; 285, Thresher Electric Company, Dayton, Ohio; 300, Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.; 302, James Wilkinson & Co., Boston, Mass.; 305, Western Electric Company, Philadelphia.

Mare Island and Puget Sound.

Class 1. Two 4-wheeled trucks—Bidder 113, $390; 138, $588.

Class 2. One concrete mixer—Bidder 46, $460; 68, $510; 126, $499; 140, $510; 143, $565; 166, $445; 175, $490; 179, $442.50; 188, $1000 and $540; 190, $594; 206, $325.

Class 3. One double cylinder drum hoisting engine—Bidder 37, $1192; 68, $1710; 73, $1565; 82, $1450 and $1465; 113, $1159; 131, $1375; 143, $1315; 166, $1225; 277, $315.

Class 4. One electric deck winch—Bidder 120, $1648; 136, $1924; 285, $1350.

Class 5. One double tandem compound steam driven air compressor—Bidder 76, $15,500; 131, $12,135; 165, $9200; 248, $8100 and $9360.

Class 6. One automatic knife grinding machine and four wood trimmers—Bidder 46, $179, part; 126, $192.87; 143, $201; 188, informal, part of class; 189, $246; 277, $100.

Newport, R. I.

Class 1. For installing electric light system complete, for installing exterior underground conduit and cable from dynamo room to main switchboard and for installing fire alarm, call bell and telephone system—Bidder 23, $6186; 74, $4420; 130, $6689; 199, $8445; 215, $7964.50; 272, $5141; 302, $6937.

Eastern Yards.

Class 9. One combination radial drill—Bidder 105, $520; 107, $494; 118, $430; 201, $475; 267, $468.

Class 119. One No. 2 Brown & Sharpe universal milling machine—Bidder 9, $729; 12, $697.60, $747.60; 36, $656, $706; 105, $683, $733; 118, $643.

Class 141. Four electric motors—Bidder 33, $2986; 58, $3445.50; 59, $3176 and $3130; 120, $3176; 263, $3487; 268, $3222; 285, $3540; 300, $3418; 305, $4650.

Class 142. Electric motors with controlling panels and spare parts—Bidder 33, $4495.05; 58, $5675.85; 59, $5867.85 and $5852.35; 75, $5887; 84, $6593.88; 120, $5792; 136, $5986; 263, $6976.75; 268, $4719.70; 285, $5629.70; 300, $5732.

Class 158. One valve reseating machine and disk cutter—Bidder 9, $325; 82, $325; 119, $325; 170, $325; 188, $325; 189, $325; 258, $325.

Class 206. One No. 1 Little Giant air motor and spare parts—Bidder 60, $268.26; 144, $90; 145, $109.35.

Class 215. Riveting and chipping hammers—Bidder 77, $267; 144, $319; 145, $385.50.

Class 216. One No. 16 Chicago air drill with tools and spare parts—Bidder 60, $269; 49, $144, $152; 145, $158.12.

Class 217. Two Little Giant Drills with repair parts—Bidder 60, $376.15; 144, $255; 145, $220.

Class 219. One drill press and one set mandrels—Bidder 82, $139; 105, $103; 188, $97.

Class 223. One valve reseating machine—Bidder 9, $325; 82, $325; 105, $325; 119, $325; 170, $325; 188, $325; 189, $325; 232, $325; 258, $325.

Class 224. One Thomas core box machine—Bidder 226, $300.

To carry the Metropolitan Railway across the Seine a new bridge crossing the waterway in a single span is to be erected in Paris. The bridge will be constructed as a three-hinged arch, with a suspended road. The span is to be 459.2 feet. A peculiar feature in the structure will be the position of the hinges. One will be at the crown, as usual, but the others will not be at the abutments, but at points about one-tenth the span out, the length between each hinge and the corresponding abutment being constructed as a cantilever. By this method of construction the live load stresses are reduced to nearly the same as in a "rigid" arch, while the heavy temperature strains liable to arise with the latter system of construction are avoided. Practically the same idea has been advanced before, but so far as is known this is the first time that this system of construction is to be adopted in practice.—*Engineering (London)*.

The American Iron & Steel Mfg. Company.

Following is the annual report of President J. H. Sternbergh to the stockholders of the American Iron & Steel Mfg. Company, Lebanon, Pa.:

In our line of manufactures the year 1904 has been characterized by a very conservative demand on the part of buyers and a correspondingly active competition for orders on the part of manufacturers, resulting in an extremely low range of prices. This company's sales in money value of all manufactured goods during 1904 were about 20 per cent. less than in 1903, notwithstanding the total tonnage sold in 1904 was a little greater than in 1903. An improvement, however, both in demand and in prices has lately appeared, and the prospects are for better business in 1905 than we realized in 1904.

During a period of five or six months in 1904 about half of our machinery for the production of bolts, nuts, rivets, &c., was standing idle for want of orders. However, we have paid the regular quarterly dividends on our preferred stock amounting to $150,000, and have paid $157,161.86 for betterments and extensions, and have charged $50,000 to the reserve fund to provide for depreciation of buildings and machinery, and have written off the balance of $24,895.87 to our charter and organization account, and have added $46,625.15 to undivided profits, making the latter amount $290,829.27, as per statement herewith.

All things considered, we regard this as a very fair showing for an off year. But this result could not have been attained except for the constant and faithful services of our principal officers, Messrs. Lord, Richards, Hallman, H. M. Sternbergh, Gulliney, Hutchinson and others, to all of whom great credit is due.

A call has been made by the Board of Directors of $2.50 per share on the 340,000 shares of our common stock, payable February 28 next, with which we hope to pay off our note indebtedness and thus place our company in a more satisfactory financial condition. At the same time the common stock will be reduced from 340,000 shares to 51,000, and by the exchange of six and two-third shares of the former for one of the latter will be made full paid at $50 per share, and thereafter nonassessable.

The consummation of this project, together with the work referred to in our second annual report of placing our plants in first-class physical condition, completes the object the present administration has long had in view. The shareholders of the company may now therefore feel congratulated not only upon the excellent physical condition of the company's plants, but the prospective high financial condition of the company.

Following is the statement of assets and liabilities as of December 31, 1904:

Assets.

Accounts receivable (discount, doubtful and worthless accounts written off)		$564,342.32
Cash		177,116.35
Charter and organization account	$186,718.99	
Written off prior to December 31, 1903	$161,823.12	
Written off for year 1904	24,895.87	
	186,718.99	
Inventory (at cost prices)		1,211,422.88
Real estate, plants and equipments		4,730,507.02
Total		$6,683,388.57

Liabilities.

Capital stock:		
Preferred	$3,000,000	
Common	1,700,000	
		$4,700,000.00
Current liabilities (including wages to December 31, 1904)		1,142,559.30
Reserve Fund (to provide for depreciation)		550,000.00
Undivided profits		290,829.27
Total		$6,683,388.57

The directors for 1905 are: Edward Bailey, Arthur Brock, Horace Brock, John J. R. Craven, Thomas Evans, C. M. Hallman, H. H. Light, James Lord, H. M. M. Richards, J. H. Sternbergh and H. M. Sternbergh. The executive officers are: J. H. Sternbergh, president, Reading, Pa.; H. M. Sternbergh, vice-president and general manager, Reading, Pa.; H. M. M. Richards, treasurer, Lebanon, Pa.; C. M. Hallman, secretary, Lebanon, Pa.; James Lord, manager Lebanon plants, Lebanon, Pa. The Executive Committee consists of James Lord, H. M. M. Richards, C. M. Hallman and H. M. Sternbergh. The general offices are at Lebanon, Pa.

Proposals Invited for Three Scout Cruisers.

WASHINGTON, D. C., February 7, 1905.—The Secretary of the Navy will open bids at noon April 15 for the construction of three scout cruisers of not more than 3750 tons trial displacement, carrying the most powerful ordnance of vessels of their class, having the highest speed compatible with good cruising qualities and great radius of action, and to cost, exclusive of armament, not to exceed $1,800,000 each. These vessels will be known as the Chester, the Birmingham and the Salem. Their general dimensions and features are as follows:

Length between perpendiculars	420 feet.
Breadth molded	46 feet 8 inches.
Displacement on speed trial not more than	3,750 tons.
Mean draft to bottom of keel at trial displacement not to exceed	16 feet 9½ inches.
Total coal bunker capacity, about	1,250 tons.
Coal carried on speed trial	475 tons.
Feed water carried on speed trial	50 tons.

Doubt As to Turbine Engines.

The act of Congress authorizing the construction of these vessels directed the Secretary of the Navy to cause them to be built by contract or in the navy yards, in his discretion. It was the original understanding that two of these vessels would be equipped with turbine engines, presumably one of the Curtis type and the other of the Parsons type, while the third cruiser would be fitted with the regulation reciprocating engines. For more than a year efforts have been made to procure plans from turbine builders for these installations, accompanied by certain necessary guarantees. This project has failed, however, and it now seems probable that all three vessels will be equipped with reciprocating engines. The Department desires, however, to afford an opportunity up to the last moment for the turbine builders to supply engines of this type, and accordingly proposals are invited for the construction of the three cruisers under two classes, as follows:

Class 1. For the construction of the hull and machinery, including engines, boilers and their appurtenances, and for equipment, complete in all respects, in accordance with the plans and specifications provided by the Secretary of the Navy, and for installation of ordnance and ordnance outfit.

Class 2. For the construction of the hull, and for equipment, complete in all respects, and for the installation of ordnance and ordnance outfit, in general accordance with the plans and specifications provided by the Secretary of the Navy, but on the bidder's design of machinery, preference being given, other things being equal, to a turbine installation.

The specifications submitted by the bidders under Class 2 must cover fully the ground covered by the Department's specifications, and must be so drawn as to cover the detailed requirements of the different bureaus of the Department. Any design of machinery submitted must be in such detail and accompanied by such plans, specifications and calculations as to enable the Department to readily determine its value, and to ascertain whether it fulfills the general requirements mentioned; the data to include complete details of weights and centers of gravity, and also such calculations as will demonstrate the satisfactory strength of the whole.

Department's Plans for Motive Power.

According to the plans prepared by the Department, the engines will be of the vertical twin screw four-cylinder triple expansion type, of a combined indicated horsepower of 16,000, and arranged for outboard turning propellers when going ahead. The steam pressure will be 250 pounds in the high pressure receiver. The stroke will be 3 feet. The cylinder diameters will be sufficient for the required indicated horse-power at about 200 revolutions per minute. Each engine will be located in a separate water tight compartment. They will be provided with all the necessary auxiliaries and accessories, in accordance with the practice of the Bureau of Steam Engineering. There will be 12 water tube boilers, placed in

three water tight compartments. The boilers will be of the "Express" type, and as approved by the Bureau of Steam Engineering. There will be not less than 693 square feet of grate and not less than 37,080 square feet of water heating surface. The working pressure will be 275 pounds. The length of grates will be about 7 feet. The steaming capacity will be such that all steam machinery on board can be run at full power with an average air pressure in the fire rooms of not more than 5 inches of water.

The following auxiliary steam machinery of approved make and design, in addition to that pertaining to the main engines and dependencies, is to be supplied by the contractor and installed complete with all piping and fittings: Steering engine, windlass engine, ash hoist engines for each fire room, forced draft blowers, evaporating plant, to consist of not less than four units, having a total capacity of 16,000 gallons of fresh water per day; a distilling apparatus capable of condensing at least 16,000 gallons of water per day. The workshop tools and the ice machines will be operated by steam engines or electric motors. There will be a refrigerating plant, with a cooling effect of 2 tons of ice per 24 hours.

Time Allowance for Turbines.

The maximum time allowed for completion will be limited by the Department to 32 months if reciprocating engines are adopted and 36 months if turbines are adopted, and no bids will be considered which propose to exceed those limits. Failure to complete the vessel within the time specified in the contract will involve penalties of $100 a day for the first month succeeding the expiration of the period fixed by the contract and $200 a day thereafter until the vessel is completed and delivered, as prescribed by the contract.

Maximum and progressive speed trials and endurance trials will be held after the vessels are completed, and under conditions prescribed by the Department and in accordance with the terms of the contract, the average speed for four hours on the maximum speed trial to be 24 knots per hour. The final trial of the vessel will not take place until a period of six months has elapsed from the date of preliminary acceptance. W. L. C.

New York Pig Iron Warrant Market.

There was very little demand for pig iron warrant certificates on the New York Produce Exchange the past week, the sales aggregating only 200 tons. The following prices were established on call Wednesday noon:

	Bid.	Asked.
February	$15.90	$16.15
March	16.00	16.15
April	16.00	16.20
May	16.00	16.30
June	16.00	16.30
July	15.90	16.30

Armor Contracts Go to Bethlehem and Carnegie.

WASHINGTON, D. C., February 7, 1905.—It was announced at the Navy Department this afternoon that Secretary Morton had approved the recommendation of the Bureau of Ordnance and the special Board of Ordnance experts for the award of contracts for armor plate for the battle ship New Hampshire and the armored cruisers Montana and North Carolina. Under these recommendations the Bethlehem Steel Company will furnish the armor for the battle ship and one of the cruisers, aggregating 5666 tons, and the bolts and nuts for the three vessels, aggregating 94 tons. The Carnegie Steel Company will supply the armor for one cruiser, aggregating 2161 tons.

These awards involve the rejection of the bid of the Midvale Steel Company, which ranged from $7 to $20 per ton lower than the bids of its competitors, but this action was taken after a very careful investigation by the special board, including a detailed personal inspection of the plant of the Midvale Steel Company. The board reported that it would not be advisable to award an additional contract to the Midvale Company until that company had demonstrated unquestioned ability to manufacture armor plate under the contract awarded it last year and to make deliveries at the rate required. Referring to the success of the trial plates of the Midvale Steel Company in passing the ballistic test, Secretary Morton said that the Department did not deem that fact in itself a sufficient guarantee that the company with its present plant could produce suitable armor in the necessary quantities to justify awarding it a further contract at this time. W. L. C.

Iron and Industrial Stocks.

NEW YORK, February 8, 1905.

The special feature of the week was the sharp advance in Tennessee Coal, which was marked up from 71¼ on Thursday of last week to 77¼ on Tuesday of this week. The rise was not accompanied by any definite news, so that it is difficult to determine the cause of the movement. A few other industrial stocks were also very strong, among them being the United States Steel stocks. The preferred sold up to 96 on Monday of this week, which is the top price for this movement. On the same date the common stock sold at 31, and the new 5 per cent. bonds at 94⅜. Sloss-Sheffield common advanced from 60½ on Saturday to 63½ on Tuesday. Republic preferred advanced during the same time from 68½ to 70¾. American Steel Foundries preferred was likewise marked up from 60½ to 62. The other iron and steel stocks and car equipment stocks were well sustained during the entire week. Last prices on actiye stocks up to 1.30 p.m. to-day were as follows: Can common 9⅞, preferred 61½; Car & Foundry common 33, preferred 93½; Locomotive common 37¼, preferred 110¾; Steel Foundries common 16¼, preferred 62; Colorado Fuel 48½; Pressed Steel common 36½, preferred 90; Railway Spring common 33¾, preferred 94; Republic common 16⅞, preferred 71; Sloss-Sheffield common 63¾, preferred 102; Tennessee Coal 76½; United States Steel common 30¾, preferred (ex-dividend) 94⅛, new 5's 94¼.

The $2,200,000 of preferred stock and the $2,200,000 of common stock of the American Steel Foundries, for which application has been made to list in the New York Stock Exchange, were issued in connection with the acquisition of the Commonwealth Steel Company and the Simplex Railway Appliance Company. When this stock is listed the total amount outstanding will be $17,700,000 of preferred and the same amount of common stock.

At a special meeting of the stockholders of the Colonial Coal & Coke Company, held in Pittsburgh last week, it was announced that the company is in position to pay a dividend of at least 10 per cent. for the first year. A resolution was adopted limiting to stockholders the privilege of subscribing for the remaining treasury stock. On February 9 the subscriptions will be prorated.

The Riverside Bridge Company, Martins Ferry, Ohio, has sold the entire issue of its 6 per cent. bonds, amounting to $100,000. It is said the company will soon increase its capital stock from $200,000 to $300,000, to give more working capital.

Dividends.—Niles-Bement-Pond Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable February 15, and a semiannual dividend of 3 per cent. on the common stock, payable one-half March 18 and one-half June 17.

The Philadelphia Company of Pittsburgh, supplier of natural gas and also controlling the electric street railways in Pittsburgh, has declared a semiannual dividend on the preferred stock of 2½ per cent., payable March 1.

Pratt & Whitney Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable February 15.

International Power Company has declared a dividend of 3 per cent. on the preferred stock, payable April 15. This dividend is in addition to the one payable March 1 and is the fifth of like amount, making 15 per cent. in the total declared upon the preferred stock since October 1, 1904.

Standard Sanitary Mfg. Company of Pittsburgh has declared the regular quarterly dividend of 1¾ per cent. on the preferred and an initial dividend of 4 per cent. on the common stock, to be paid 1 per cent. quarterly, the first payment having been made along with the preferred dividend. The balance will be paid in April, July and October. The year was the most prosperous the company ever had, a greater amount having been set aside to the credit of the surplus fund.

The C. E. Sutton Company, Toledo, manufacturer of machine tools and dies, is preparing to install a steel castings plant. Steel castings and ingots weighing from ¼ pound to several tons will be produced and the equipment installed will have a capacity of 20 tons per day. The plant will be completed within 60 days. C. E. Sutton is president and general manager of the company, and F. A. Burnham is superintendent.

New York.

NEW YORK, February 8, 1905.

Pig Iron.—Some fair sales of Foundry Iron have been made in this territory during the past week, and there has been a somewhat sudden inquiry for considerable lots. This comes from interests who are usually leaders in buying movements. We quote: Northern Iron, tidewater, $17.75 to $18 for No. 1 X Foundry, $17.25 to $17.50 for No. 2 X Foundry and $16.75 to $17 for No. 2 Plain. Alabama and Tennessee Irons are quoted $17.50 to $17.75 for No. 1 Foundry and $17.25 to $17.50 for No. 2 Foundry.

Steel Rails.—Tonnage is coming in fairly. Among the sales of the week is one lot of 25,000 to 30,000 tons for the Baltimore & Ohio. An American mill has taken that part of the order of the Grand Trunk road, which is to be used for United States trackage. The announcement that the Edgar Thomson works will build a new mill specially for the rolling of Steel Rails weighing from 8 to 25 lbs. per yard, will be a surprise to the Light Rail trade.

Cast Iron Pipe.—Nothing of importance has transpired among Cast Iron Pipe interests since last report. Prices are strongly maintained on the basis of $26.50 to $27 per net ton for carload lots of 6 and 8 inch at tidewater.

Finished Iron and Steel.—The leading interest has secured contracts for two bridges from the Northern Pacific Railroad Company, aggregating 5500 tons. While nothing immediate is promised from the Far West, a great deal of railroad work is to be placed in the Central West and in the East this month which may run up to 40,000 tons or more. The building trade continues seasonably quiet. Plates and Bars are firmly held, but business is light at present. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.64½c. to 1.80c.; Tees, 1.69½c. to 1.80c.; Bulbs, Angles and Deck Beams, 1.74½c. to 1.85c.; Sheared Plates, in carload lots, 1.64½c. to 1.75c. for Tank, 1.74½c. to 1.90c. for Flange, 1.84½c. to 2c. for Marine, 1.84½c. to 2.50c. for Fire Box, according to specifications; Refined Bar Iron, 1.64½c. to 1.69½c.; Soft Steel Bars, 1.54½c. to 1.64½c.

Old Material.—While many consumers are maintaining their attitude of indifference, and thus endeavoring to bring about lower prices, especially on rolling mill stock, a decided improvement is observed in some respects. Orders have been placed within the past two or three days by buyers who a short time since professed their ability to wait considerably longer before coming into the market. Sales are reported of 6000 tons or more of practically all kinds of Old Material, covering Heavy Melting Steel Scrap, Old Steel Rails, Wrought Scrap, Cast Scrap and even Busheling Scrap. A sale of No. 1 Railroad Wrought Scrap was made at $22.75, delivered, in Eastern Pennsylvania. Some of the other sales reported were made at prices slightly higher than our maximum quotations. Holders of Heavy Melting Scrap are asking more than they did a week ago. In fact, holders of all kinds of Scrap are decidedly firm in their views and are looking for higher prices within the next few weeks. Quotations per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails	$21.50 to $22.50
Old Steel Rails, rerolling lengths	17.00 to 18.00
Old Steel Rails, short pieces	16.00 to 16.50
Relaying Rails	20.00 to 21.00
Old Car Wheels	17.50 to 18.50
Old Iron Car Axles	22.00 to 23.00
Old Steel Car Axles	19.00 to 20.00
Heavy Melting Steel Scrap	16.00 to 16.50
No. 1 Railroad Wrought Scrap	19.50 to 20.50
No. 1 Yard Wrought Scrap	17.50 to 18.50
Iron Track Scrap	17.00 to 18.00
Wrought Pipe	14.50 to 15.50
Ordinary Light Iron	11.00 to 11.50
Cast Borings	9.00 to 9.50
Wrought Turnings	13.00 to 14.00
No. 1 Machinery Cast	16.00 to 16.50
Stove Plate	13.50 to 14.00

The Louisville Bar, Bolt & Sheet Company.—The Louisville Bolt & Iron Company, Louisville, Ky., has been purchased by the Louisville Bar, Bolt & Sheet Company, which has been organized with a capital stock of $350,000. The officers are: J. L. Smith of Louisville, president and treasurer; A. F. Baumgarten of Pittsburgh, vice-president, and H. N. Trimble of Pittsburgh, secretary. The property, which consists of a complete plant for the manufacture of nuts and bolts, also contains one Belgian 12 and 8 inch mill, one 20-inch muck and bar mill. The sheet mill equipment consists of two 26-inch hot mills, one 22-inch cold mill, and the plant is also equipped for the manufacture of corrugated roofing and iron sheet bars. The sheet mills will make a specialty of iron sheet and iron roofing. The rolling mills will be placed in operation at once, and the sheet mills within 60 days.

Metal Market.

NEW YORK, February 8, 1905.

Pig Tin.—The market has remained steady during the week, notwithstanding heavy arrivals of Tin. The difficulty and delay met with in landing the metal, however, have postponed relief from the temporary scarcity of spot metal. The market, too, is being maintained, it is said, by some of the leading interests, who are purchasing all the available metal that is arriving with the object of sustaining values. Consequently spot Tin still commands a premium. To-day the market closed steady at 29.32½c. to 29.70c. for spot, 28.75c. to 29.12½c. for February, 28.50c. to 28.87½c. for March and 28.37½c. to 28.62½c. for April. The London market shows a decline of 7 shillings 6 pence, being quoted to-day at £131 5s. for spot and £130 for futures. The arrivals so far this month have amounted to 2380 tons, and it is estimated that 3020 tons are afloat. The statistics for the month of January, as published by the New York Metal Exchange, show that the deliveries into consumption last month were large, amounting to 3400 tons, as against 2300 tons for the same month of last year. Shipments from the Straits for January were 5325 tons, as against 4983 tons for the same month of last year.

The total visible supply on January 31, 1905, was 1470 tons below that of January 31, 1904.

	Tons.
Arrivals at the Atlantic ports amounted to	2,820
Total arrivals since January 1, 1905	2,820
Of which from Straits by direct steamers	600
Of which from United Kingdom	1,930
Of which from Holland	20
Of which from European Continent	270
The deliveries for January we figure as	3,400
Total deliveries since January, 1905	3,400
Deliveries same period in 1904	2,300
The shipments from Straits amounted to	5,325
Against previous month	5,142
Against January, 1904	4,983
Australia shipped	350
Against previous month	330
Against January, 1904	428

Statistics for the United States, Pacific ports excluded, January 31 show as follows:

	Tons.
Stocks, including on dock and arrivals	661
Afloat	4,675
Total	5,336

Below are given the total statistics for Europe and the United States, showing:

	Tons.
Total visible supply January 31, 1905	15,645
Against visible supply December 31, 1904	14,768
Against visible supply January 31, 1904	17,115

Copper.—A dull market with a somewhat easier tone is to be recorded. Both home and foreign buyers show decided apathy in the matter of purchasing and prices are virtually nominal, there being not enough business to absolutely test the market. Prices to-day are as follows: Lake, 15.25c. to 15.37½c.; Electrolytic, 15.12½c. to 15.25c.; Casting Copper, 14.87½c. to 15c. The London market shows a slight decline, the cables to-day reporting £67 5s. for spot, £67 11s. 3d. for futures and £70 15s. for Best Selected. The exports so far this month have reached only 2577 tons.

The statistics for the month of January, as compiled by C. Mayer, secretary of the New York Metal Exchange, are as follows:

Exports were fair. The total for the month shows a decrease of 9,391 tons, compared with the same period of last year.

The exports of domestic Copper from Atlantic ports for month of January, as per Custom House returns, were as follows:

	Copper. Tons.	Matte. Tons.
From New York	11,380	20
From Baltimore	7,917	..
From Philadelphia	386	..
Totals	19,683	20

Reducing the Matte at 55 per cent. into fine Copper, the total exportation for January amounts to 19,694 tons of 2,240 lbs.

	Tons.
Total exports since January 1, 1905, exclusive of Southern ports for January	19,694
Against same period in 1904	29,185

During the month of January following arrived at New York, Baltimore and Philadelphia by steamers only:

	Tons
From Europe, Copper	483
From Mexico, Copper	2,202
From Cuba, Matte	233
From Cuba, Ores	2,700
From Spain, Ores	10.090

Pig Lead.—Difficulty in obtaining shipments from the West has caused a scarcity of spot metal here. In consequence, the market has remained very firm, prices being a shade higher than those ruling a week ago. Demand, however, is merely of moderate proportions. Spot Lead is quoted here at 4.55c. to 4.60c., and St. Louis telegraphs 4.35c. London price to-day ruled at £12 11s. 3d. The American Smelting & Refining Company still quotes 4.45c. on Desilverized in 50-ton lots, shipment in 30 days.

Spelter—Is dull and lower. Demand is light, and, notwithstanding that stocks are very moderate, they are more than adequate to the consumptive requirements. Spot Spelter

was quoted at the close to-day at 6.10c. to 6.20c. The St. Louis market is lower, at 6c. London cables are unchanged at £24 15s.

Antimony.—The market is dull and easy. Cookson's rules at 8.25c. to 8.50c.; Hallett's, which is scarce, at 8.25c. to 9c.; Japanese, 7.75c. to 8c., and other brands at 7.37½c. to 7.62½c.

Quicksilver.—The market is firm and unchanged, flasks of 75 lbs. being quoted at $40. The London market rules at £7 12s. 6d.

Nickel.—Business is of about the usual proportions and prices are without change, large lots being quoted at 40c. to 45c. and smaller quantities at 50c. to 60c.

Tin Plates.—Nothing new has been developed in connection with this market. The mills are all actively employed on contracts placed some time since and the volume of current business is not especially heavy. Prices are firmly held. The American Sheet & Tin Plate Company quotes on a basis of $3.74 a box for 14 x 20 100-lb. Coke Plates, f.o.b. New York, or $3.55, f.o.b. Pittsburgh. The Welsh market is 1½d. lower, at 12s. 1½d., f.o.b. Swansea.

Labor Notes.

Organized labor in Milwaukee, Wis., has placed itself on record as opposed to the proposed plan of establishing a trades school in that city, the preliminary plans of which have been made under the auspices of the Merchants' and Manufacturers' Association. The Federated Trades Council has passed resolutions expressing its opposition, its principal argument being that such schools are "invariably used to breed workers who can be used as strike breakers in time of labor troubles." This is by no means the first time that organized labor has opposed the establishing of trade schools, and it is not likely that the resolutions will have any more weight in preventing the establishing of the school in Milwaukee than similar opposition in other cities.

James McMahon, president of the National Association of Blast Furnace Workers, states that the furnace workers will demand an eight-hour day on June 1, and if it is not granted there will be a general suspension of work at the blast furnaces in the Mahoning and Shenango valleys. It will be recalled that agitation for an eight-hour day for blast furnace workers has been brought up several times in the past two years, but nothing has been accomplished. It is claimed that it is not feasible for blast furnace labor to work only eight hours per day instead of 12 hours as at present, as there is not enough labor of this kind to fill the demand in case an eight-hour day should be adopted.

A conference will probably be held in March between the officials of the Amalgamated Association and the Youngstown Iron Sheet & Tube Company, Youngstown, Ohio, for the purpose of adjusting the skelp mill scale.

John Bates Scully, secretary-treasurer of the Scully Steel & Iron Company, Chicago, committed suicide as a result of acute melancholia, February 3. He was born in Chicago, March 23, 1855; was educated in the city public and high schools, and at the age of 18 entered the employ of Joseph T. Ryerson, Chicago, progressing from office boy to bookkeeper and cashier. In 1885 he changed his connection to the Raymond Lead Company, remaining until 1892, at which time he entered into business with his brother, Alexander B. Scully, forming the Scully Steel & Iron Company. The phenomenal growth of the business as conducted by the two brothers is attributed equally to the skill and industry of John B. Scully in managing the financial end of the concern and the genius of his brother as a merchant. He was a member of the Presbyterian Church, of the Union League, Chicago Athletic and Ashland clubs, the Westward-Ho Golf Club and the National Manufacturers' Association. He leaves a widow and a daughter.

The new plant of the Driggs-Seabury Ordnance Corporation, Sharon, Pa., was put in partial operation on Monday.

OBITUARY.

HERMAN DIENELT, president of Dienelt & Eisenhardt, Incorporated, Philadelphia, died February 4. He had been ill with a complication of diseases for nearly four months. He was born in Braunschweig, Germany, in 1836, being, therefore, in his sixty-ninth year. Coming to this country at the age of 16, Mr. Dienelt became apprenticed to Wm. P. Uhlinger, Philadelphia, with whom he learned the trade of machinist, and afterward became superintendent of the plant. In 1874 he and G. F. Eisenhardt formed a partnership under the name of Dienelt & Eisenhardt, engaging in the general machine business at Seventeenth street and Fairmount avenue, moving from there in 1879 to the present location, Howard and Thompson streets. In 1897 Mr. Eisenhardt died, Mr. Dienelt thereafter purchasing his share of the business, which in 1903 was incorporated, and since which time Mr. Dienelt has served as president. Besides being well known in the foundry and machine trade Mr. Dienelt was one of the organizers and at the time of his death was vice-president of the Franklin Trust Company of Philadelphia and was also active in Masonic and other circles. He is survived by a widow and one son.

JOHN A. WEIMER, president of the Weimer Machine Works, Lebanon, Pa., died February 4, aged 42 years. Mr. Weimer was one of the best known iron and steel men of the Lebanon Valley and had been identified with the Weimer Works since his youth, many of its specialties in engines and cars having been developed under his management. In 1892 he became its president and also filled the position of superintendent. Mr. Weimer served as Mayor of Lebanon and was active in fraternal orders.

Homestead Reports Untrue.—We can state officially that daily press reports to the effect that 12 50-ton open hearth furnaces would be built at the Homestead Steel Works of the Carnegie Steel Company are untrue. The erection of more open hearth furnaces at the Homestead works has not been contemplated. The report is also untrue that A. C. Dinkey would soon resign as president of the Carnegie Steel Company to identify himself with the Bethlehem Steel Company. There is no foundation for this report whatever.

Daily papers this week published the report that the American Shipbuilding Company contemplated making extensive improvements to its shipbuilding plant at Lorain, Ohio. R. C. Wetmore, secretary and treasurer of the company, states that there is no truth in the report. He says the company recently purchased 22 acres of land adjoining its plant at Lorain, and that as part of the tract was marsh land a contract had been closed for grading and leveling the entire tract, but he denies that the company contemplates making any extensions to its plants, either at Lorain or at any other points.

The Lackawanna Steel Company has begun the erection of a 40-inch blooming mill, on which work was suspended some time since. The greater part of the machinery is on the ground. The mill will serve rail mill No. 2, on which angle bars and light rails are rolled, and the continuous bar mill which was successfully started recently. The Lackawanna Steel Company has ordered the starting of the blast furnaces at Lebanon, Pa., which have been idle for some time.

The Carroll Foundry & Machine Company, Bucyrus, Ohio, is enlarging its plant and placing orders for a number of new machine tools. J. Carroll is manager of the company.

The City Council of Sandusky, Ohio, has passed an ordinance providing for the issuing of $75,000 worth of bonds to be spent in improving the lake front near the Pennsylvania docks. It is stated that out of town capitalists have agreed to erect a large blast furnace in that city if the improvement is made.

HARDWARE.

HARDWARE stores are not difficult to recognize. The traveling salesman who is not able to discriminate between a store carrying a general line of Hardware and one keeping a few selected Hardware goods in connection with a larger stock of absolutely unrelated merchandise would hardly be considered qualified to act as the representative of a jobbing house or of an alert manufacturing establishment. In fact, any man of average intelligence can surely judge the character of a store by observing the display of samples in the window, together with the usual additional efforts made to attract the attention of those who pass by. A man does not need a technical education to determine whether a store which comes under his observation is a department store or whether it specializes to some extent in a certain line of merchandising. He would never class with Hardware stores one keeping a few samples of Tinware in a window together with display cards offering inducements in groceries. The evidences of the direction in which a merchant is bending his energy are always too conspicuous to permit any but the dullest intellects to make a mistake in this respect.

These observations are induced by the receipt of the communication which is presented in another column discussing the attitude of Hardware dealers' associations in endeavoring to have the sale of Hardware confined to legitimate dealers. The writer of that communication refers to the fact that Hardware dealers are themselves adding new lines and thus trespassing on the preserves of other tradesmen. Therefore he argues that their complaints or demands are "foolish, unreasonable and absurd." To this arraignment we take exception. It is acknowledged that the tendency among merchants during recent years has been to depart from rigid specializing and to include in the stocks carried either related lines of merchandise or lines which offer some opportunities of profit or of enlarging their business, and which can be handled without technical knowledge of the trade involved. It has been well said that the restless activity of the age incites all commercial enterprise to break away from time tried methods. But it is this tendency which is to-day causing a great deal of dissatisfaction in the Hardware trade, and which Hardware merchants are manfully combating in the interest of self preservation. So many articles in the Hardware line which are in constant use in the household are so easy to handle that merchants in totally different branches of trade have placed such articles in their stocks, using them as leaders to induce wider patronage, and thus secure a flow of customers to their shops, who may then be reasonably expected to purchase other goods. This matter has progressed to such an extent that the retail Hardware trade has been compelled by the force of circumstances to take cognizance of it. Two courses are open to them. One is to go with the tide and become general merchants, which may or may not prove to be advantageous. The other is to make strong efforts to keep their own trade confined to its proper channel. It should be borne in mind that this is not an academic or sentimental question. It is one which scarcely admits of humorous or frivolous treatment, as it vitally concerns the material interests of practically every retail Hardware merchant. The question is not one of mere abstract theory or finely drawn arguments, but of hard facts. Those whose interests are mainly in Hardware are more and more appreciating this condition, and the attention of manufacturing and jobbing interests is undoubtedly being drawn more closely than ever to the conditions prevailing in the retail Hardware trade. They are recognizing the force of the position taken by the retail Hardware associations when they adopt such principles as those set forth in the resolutions governing numerous State associations, as follows:

> *Resolved*, That it is the sense of this association that the interpretation of the term "retail Hardware dealer" be construed to mean any person having an established place of business carrying a line of Hardware, Stoves, Tinware and such goods as are usually kept in a first-class Hardware store; and in cities of less than 5000 population all persons carrying a general line of Hardware in connection with any other kind of merchandise.

Resolutions of this character have been adopted by practically every association of retail Hardware dealers. They thus define the business conducted by legitimate Hardware dealers with sufficient plainness not to be misunderstood. Such dealers should have the active sympathy and co-operation of those manufacturers and jobbers whose goods are more naturally marketed through Hardware merchants than any other class of tradesmen.

Condition of Trade.

Hardware trade conditions warrant slight comment regarding change, the trade as a whole progressing normally. Orders in January have not been as large as was anticipated considering the activity in the closing months of 1904, current orders partaking rather of a filling in character. Manufacturers and jobbers alike are moving conservatively, the former, but cautiously, advancing prices when compelled by higher rates for raw stock, while buyers, although confident of the future, are equally moderate in specifying. To severe meteorological conditions is attributed a partial slackening of trade, which so far has made especially difficult both getting about and carrying on outdoor enterprises. Generally the normal demand is good for this season of the year, a competent authority asserting that January business was ahead of the average for all of 1904, with better prospects for 1905 throughout. In, for example, Builders' Hardware outside the metropolitan district there are indications of large demands from builders and contractors through the various channels from which their supplies are drawn. In the immediate territory of Greater New York, however, only a fair amount of building is looked for and in the comparatively cheaper grades of buildings. So far as the situation applies to the larger and more costly structures there is a pronounced timidity regarding the influence of labor disputes, which act as a deterrent, pending some definite and permanent understanding between labor and capital, particularly in the erection of costly structures that sometimes individually represent the tying up of millions of dollars in site and building. When such a settlement is made, however, the fact that New York is clearly underbuilt, owing to the great and steady growth of population, will call for the use of large quantities of material. Southern business is referred to by those conversant with it as unusually good, notwithstanding the shrinkage in value of their important staple, the high average price of cotton, however, for several years having accumulated a great deal of the circulating

medium in that section of the country. In exports trade with Continental Europe and the various colonies appears to be improving, with Mexico only fair, Cuba good and Japan excellent.

Chicago.

Spring business is assuming very satisfactory proportions, with the buying quite evenly distributed over the various lines. Last week's advance on Wire Nails and Wire products was expected, and there is a feeling that prices will go still higher. Makers of puddled iron Cut Nails have been gradually strengthening their position until they are now on a basis where they are getting from 5 to 10 cents more than the price on Wire Nails. A noteworthy indication of market conditions was the fact that the manufacturers and jobbers who exhibited at the Wisconsin State Hardware dealers' convention last week report that they booked more actual orders than they had ever done in any previous convention. As a matter of fact exhibitors do not as a rule expect to take many orders, their exhibits being charged to advertising rather than selling account, but the amount of business placed by the visiting dealers indicates that they are looking forth courageously to an unusually large season.

NOTES ON PRICES.

Wire Nails.—As noted in our last issue, prices of Wire Nails and Wire were advanced by the American Steel & Wire Company $1 a ton, taking effect February 1. Stocks of Wire Nails are not heavy at the mills and they have all the business that they can comfortably take care of. Contracts are restricted to shipments within 60 days from date of order. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carload lots to jobbers	$1.80
Carload lots to retailers	1.85

New York.—The advance of 5 cents per keg in the price of Nails on February 1 makes New York quotations as follows: Single carloads, $1.99; small lots from store, $2.05. Continued winter weather retards the revival in demand.

Chicago.—The new price on Wire Nails that went into effect February 1 has apparently not at all retarded buying, although it affects few of the large buyers, as nearly all of them have been covered by contracts. The new figures as are follows: $1.95, base, in car lots to jobbers; $2 to retailers, with 5 cents extra for less than car lots from mill.

Pittsburgh.—On Wednesday evening, February 1, the American Steel & Wire Company made announcement of a long expected advance in price of Wire Nails of 5 cents per keg, the notice coming too late to be incorporated in this report last week. The same advance has been made by leading independent mills, but, as before noted in this report, a leading local independent interest has been quoting $1.85 for Wire Nails for some time. The demand is referred to as fairly active for the season of the year and indications point to a heavy spring trade. The leading interest and the outside mills continue to follow the policy of booking business for shipment within 60 days only from date of contract. The new prices effective from February 1 are as follows: Wire Nails in carloads to jobbers at $1.80 and in less than carloads at $1.85, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days.

Cut Nails.—An advance of $1 per ton took place on February 1, following a similar advance in Wire Nails. Mills have considerable business on their books in the way of contract orders, while current demand is fair. Quotations are as follows: Carload lots, $1.80; less than carload lots to jobbers, $1.85, and to retailers, $1.95, f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Steel Nails.

New York.—Prices were advanced 5 cents per keg in conformity with the advance of $1 per ton on Wire Nails on February 1. The demand is naturally moderate, with climatic conditions unfavorable for work. New York quotations are as follows: Carloads on dock, $1.94; less than carloads on dock, $1.99; small lots from store, $2 to $2.05.

Chicago.—The advance in Wire Nails brings with it automatically an advance in Cut Nails, making the present quotations $1.95 for car lots to jobbers for Steel Nails; $2 in car lots to retailers; 5 cents extra for less than car lots, and from 5 to 10 cents extra for Puddled Iron.

Pittsburgh.—Following the advance of 5 cents a keg in Wire Nails some of the Cut Nail mills made a corresponding advance in prices and now quote on the basis of $1.80 for carloads. The demand for Cut Nails is reported to be fairly active, and the mills have a good deal of business on their books. We quote: On carloads, $1.75 to $1.80, base; less than carloads to jobbers, $1.80, base; less than carloads to retailers, $1.90, base, plus carload rate of freight to point of delivery; terms, 60 days, less 2 per cent. off for cash in 10 days. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities are 10 cents a keg higher than above prices.

Barb Wire.—The advance in Wire on February 1 of $1 per ton has not had any appreciable effect on the demand, which remains about the same as previous to the change. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago.—Spring business is coming in with exceptional activity, and the $1 a ton advance made February 1 has apparently served to stimulate buying or it has at least not retarded it. The new prices are as follows: Car lots to jobbers, Painted Wire, $2.10; Galvanized, $2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, $2.25; Galvanized, $2.55; Staples, bright, $2.05; Galvanized, $2.35.

Pittsburgh.—Effective February 1, the American Steel & Wire Company made an advance of $1 a ton in Barb Wire, the notice coming too late to be used in the report of last week. The demand is light, as it always is at this season of the year, but a material increase in tonnage is expected this month when spring trade is expected to open up. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Smooth Fence Wire.—The advance of $1 per ton on Wire and Wire products on February 1 affected Smooth Fence Wire to that extent. Buying continues active at the advance. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—The heavy demand continues unabated, and as the advance of $1 a ton was accompanied by an average advance of $1.50 a ton on Wire Fencing, so the makers of Wire Fencing who buy their Wire are a little better off as far as margin of profit is concerned than they were before. The new figures on Smooth Fence Wire are $1.80, base, for Annealed Wire, in car lots to jobbers; $1.85 in car lots to retailers, with 5 cents advance for less than car lots, and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—On February 1 the American Steel & Wire Company and the outside mills made an advance of $1 a ton in prices, effective from that date. The demand is reported as being quite active, while specifications on contracts are coming in very freely, giving the

mills plenty of work. The leading interests continue the policy of booking business for shipment within 60 days from date of contract. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

Tacks.—The tendency of the Tack market is toward higher prices and some of the manufacturers have made advances, owing to the high price and scarcity of Tack Plate. This does not, however, indicate any more uniformity in prices than has characterized the market in the past.

Paris Green.—Quotations are unchanged and are adhered to as far as can be learned. Some of the manufacturers are guaranteeing prices against a decline on or before March 15, the latest date for making contract deliveries. Quotations are as follows:

	Per lb.
Arsenic kegs	12 c.
Kegs, 100 to 175 pounds	12½c.
Kits, 14, 28 and 56 pounds	13½c.
Boxes, 2 and 5 pounds	13½c.
Boxes, 1 pound	14 c.
Boxes, ½ pound	15 c.
Boxes, ¼ pound	16 c.

These prices are subject to the following differentials:

	Extra.
5000 to 10,000 pounds	½c.
1000 to 5000 pounds	1 c.
500 to 1000 pounds	1½c.
Less than 500 pounds	2 c.

Binder Twine.—Last week the International Harvester Company instructed its agents to quote no prices until further orders, which is equivalent to withdrawing from the market temporarily. It is supposed that the company has sold all the Twine that can be made from the fiber bought up to the time prices were announced, which was December 5, 1904. It is assumed that other concerns, with the exception of the manufacturers who have already announced an advance of ¼ cent per pound, are selling at the International's former schedule. In absence of definite advices regarding change in price we repeat quotations, as follows:

	Per lb.
Sisal	9½c.
Standard	9½c.
Standard Manila (550 feet)	10½c.
Manila (600 feet)	11½c.
Pure Manila (650 feet)	12½c.

Five-ton lots, ⅛ cent less; carload lots, ¼ cent less, Chicago delivery, usual terms of payment. Kansas City, Omaha, Council Bluffs and Minneapolis, ¼ cent added. Prices not guaranteed. Allowing for freight, New York prices would be ¼ cent lower than the above.

Rope.—A slight improvement is noticed in the demand since the advent of the month, but as yet it is of limited proportions. Quotations remain unchanged and are as follows: Pure Manila, 11¾ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8¼ cents per pound.

Window Glass.—It is understood that the Manufacturers' and Jobbers' Window Glass Company is anticipating making a slight advance in the price of Glass in the near future, having learned upon investigation that the manufacturers' and jobbers' stocks are depleted to a considerable extent. The meeting of the independent Glass manufacturers, to which reference was made last week, for the purpose of co-operating with the Manufacturers' and Jobbers' Window Glass Company regarding prices, was not held. It is reported that Western jobbers are quoting Glass as follows: All first three brackets, 90 and 20 per cent. discount; all sizes above, 90 and 15 per cent. discount. New York quotations are as follows: First two brackets, single, 90 and 15 per cent. discount; larger sizes single and all double strength, 90 and 5 per cent. discount; all from jobbers' list of October 1, 1903.

THE offices, warerooms and factory of the Newhall Ship Chandlery Company, 78 South street, New York, were damaged by fire on Thursday, January 26, which, although fully covered by insurance, temporarily inconveniences the company in the conduct of its business. A temporary office has been opened at 70 South street, and active business will be resumed as soon as the insurance has been adjusted, which will necessarily somewhat delay the shipment of orders.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses and are referred to the manufacturers:*

FROM G. & C. E. WILSON, Livingston, Groveland Station, N. Y., who have recently embarked in the general Hardware business.

FROM HINES-SEMMES HARDWARE COMPANY, Washington, Ga., which has been incorporated, and will begin business about March 1, handling Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting and House Furnishing Goods. James Hines will manage the business, the other parties interested being Raphael Semmes of Savannah and Xavier Semmes of Madison County, Miss.

FROM STEVENS BROTHERS, Westfield, Ill., who have succeeded W. L. Biggs in Hardware, Implements, Stoves, Seeds, Paints, Oils, &c.

FROM COLSON HARDWARE COMPANY, Brunswick, Ga., which is opening up a fine retail store in addition to its present business. It is intended to add Crockery and Lamp Goods and to cater for a much larger business in Guns, Ammunition and Sporting Goods.

FROM CREVISTON & SPAIN, North Lewisburg, Ohio, who have succeeded J. H. Dominy in the Hardware, Stove and Implement business.

FROM AL. T. MILLER & SONS, Peru, Ind., who have lately commenced operations as dealers in Shelf Hardware, Stoves and Tinware, Implements, Paints, &c.

FROM C. F. HARRIS, Forest Grove, Ore., who has begun the retail business in Shelf Hardware, Stoves, Paints, Sporting Goods, furniture, &c.

FROM F. S. THOMPSON, Amsden, Ohio, who has added Farming Implements to his general stock of Hardware and other lines. Mr. Thompson expects to double his floor space during the summer months, and will then materially enlarge his Hardware and Implement lines.

FROM JOHN M. KEYES, Concord, Mass., dealer in Sporting Goods, Paints, Cutlery, Electrical Supplies, Automobile parts and sundries.

FROM J. P. HAYTER, Fort Worth, Texas, whose Hardware, Stove and Sporting Goods stock was badly damaged by fire and water a short time since.

FROM AMIOT, LECOURS & LARIVIERE, Montreal, Canada, wholesale and retail Shelf and Heavy Hardware, Paints and Oils, Sporting Goods, Plumbing supplies, &c.

The Hardware, Cutlery, Crockery, Glassware and Silver Ware stock of Eaton Hardware Company, Brunswick, Me., was ruined by fire on the 18th ult. in the upper floors of the building, only the first floor of which was occupied by the company. The loss was $11,700, with insurance aggregating $10,000. The company at once secured quarters elsewhere and was open for business three days later with a new stock of goods. A workshop and two storehouses not connected with the main establishment were not damaged, so that the company was able to draw upon a reserve stock of goods. Work on the damaged building is progressing rapidly, and the company expects to be back in its old quarters by March 1.

THE BRISTOL BRASS COMPANY, Bristol, Conn., has elected the following board of officers for the ensuing year, the list being identical with that of the American Silver Company: President, Pierce N. Welch; vice-president and treasurer, Julian R. Holley; secretary and assistant treasurer, Samuel B. Harper. Directors: Pierce N. Welch and Henry F. English of New Haven; Julian R. Holley, George S. Brown, Geroge W. Mitchell, S. B. Harper, Roger S. Newell, Dean Welch and Charles T. Treadway, all of Bristol. Mr. Treadway fills the vacancy caused by the death of his father, Charles S. Treadway.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

POINTERS FOR THE HARDWAREMAN.—II.

BY ON-THE-ROAD.

ONE or two blackboards outside the store may be used to advantage in making special announcements, such as new lines or goods added to the stock, demonstrations or exhibitions, special sales, season goods, prices, &c. These announcements should be of a live, breezy character. If prices are mentioned they should obviously be of the sort to impress passers-by favorably. These blackboards may be placed near the edge of the sidewalk, on one side or both sides of the entrance, or in some other convenient and eye catching position.

Outside Blackboards

Some of my customers allow their clerks a certain percentage on sales made during the Christmas holiday season. This acts as a spur or incentive to make their sales as numerous and large as possible. This plan might also be used at other times during the year, on the occasion of fairs, local celebrations, special sales, &c. At the Christmas period the commission earned by the clerks is given to them on Christmas eve, a time when it is very appropriate and no less acceptable.

Commissions on Sales

Every parcel which leaves the store should contain some advertising in the interest of the establishment. This may be done through the medium of the wrapping paper, or leaflets, circulars, &c., may be inclosed with the wrapped up purchase. Many merchants are opposed to using wrapping paper bearing a conspicuous store announcement, as the public generally do not care to pose as live advertisements for any store by carrying packages from it which are wrapped in such a manner as to expose an offensively large ad. of the place of purchase. Such merchants often find it much more advantageous to use wrapping paper of a distinctive color, which at once identifies the store and is not offensive to its patrons. But by all means have a supply of leaflets, folders, booklets, &c. (see that your manufacturers keep you well stocked in this particular), and use them liberally and invariably in connection with your parcels.

Parcel Advertising

Some merchants with a view to increasing the efficiency of their clerks and securing their personal interest in the business have adopted the co-operative idea, giving the salespeople a percentage of the profits on all sales over a stipulated amount. The latter is figured out by the proprietor to cover all expenses together with a fair profit to the "boss." The merchants who have tried this plan express themselves much gratified with the results.

Dividing with the Clerks

Entering a store not long since I observed a good deal of animation in the House Furnishing Goods department. A number of persons were gathered together, and, looking for the cause, I found a comely and appropriately attired young woman busily at work manufacturing delectable biscuit in one of the firm's most attractive Ranges. It seems that the firm were at that time calling special attention to their large stock in the Stove and House Furnishing line, and had engaged a woman who was locally famous for her gift of preparing dishes which tickled the palate to provide biscuit enough for all, and many visited the store, for the event was well advertised. A biscuit was tendered to each caller, together with the patty pan in which it was baked.

A Biscuit Episode

Nebraska Retail Hardware Dealers' Association.

TUESDAY morning's session was informal and devoted to the making up of the register, payment of dues, giving out of badges, introduction of members, &c. It was thus apparent that careful preparations had been made for the convention. The numbers on the attractive ribbon badges designated the members and visitors, as a printed key was furnished. The large number of these badges given out indicated a very gratifying attendance of the members, which, with the presence of representatives of the Omaha jobbing trade and of many maufacturers, promised well for the success of the gathering.

The official programme issued in connection with the convention is a very attractive one. The nickel Padlocks binding together its various sheets were furnished by the Lee-Glass-Andreesen Hardware Company of Omaha. An aluminum plate attached to the Padlock and reproducing the shape of the State of Illinois presents the compliments of the Quincy Stove Mfg. Company of Quincy, Ill.

Afternoon Session.

At 2 o'clock the convention was called to order by President Cornell. After the invocation by Rev. T. J. Mackay, an address of welcome was made by E. J. McVann of Omaha, to which H. J. Hall very happily responded. The address of the president and report of the secretary-treasurer referred to the good work done by the association and reflected its prosperous condition.

The subject of "Scientific Salesmanship" was presented by T. L. Kenyon, after which a careful discussion of the question as to meeting catalogue house competition was presented by M. A. Hargleroad in executive session. It called out a number of interesting experiences and suggestions from the meeting. A forcible address was made on the general subject by M. L. Corey, secretary of the National Retail Hardware Dealers' Association, thus practically concluding an interesting session.

Banquet.

Tuesday evening a banquet tendered by the merchants of Omaha was served to a large company in which were a number of ladies. W. Glass of Lee-Glass-Andreesen Hardware Company very gracefully and happily presided as toastmaster, the toast list being as follows:

"Benfits to Be Gained by Attending Retail Dealers' Annual Convention," C. H. Rudge.
"Sharp Points in Trade," Morris Hussie.
"The West as Seen by the East," R. R. Williams of *The Iron Age*.
"Reminiscences of a Hardware Salesman," C. O. Loebeck.
"It Is a Good Thing, Push It Along," Max Uhlig.
"Words of Good Cheer," Rev. T. J. Mackay.
"The Ladies," H. J. Hall.

After an entertainment in sleight of hand by C. A. Victor, the evening concluded with the unfurling of the Stars and Stripes and the singing of "America."

The Wednesday morning session was devoted to the reading of papers on trade topics and discussion.

The Hardware firm of Lewis & Creed, New Albany, Ind., has dissolved partnership, Wm. P. Lewis retiring. Walter P. Creed will continue the business under his own name. The firm was organized about 16 years ago and had met with much success. Mr. Lewis, who is widely and favorably known throughout the trade from his former prominence in the Indiana and National Retail Hardware Dealers' associations, both of which he has served as president, has not yet announced his future plans.

Fred. Soehnholz of Cologne has entered into partnership with Joseph Neubeiser in the Hardware, Stove, Implement, Sporting Goods and Seed business at Belle Plaine, Minn., and the style is now Neubeiser Hardware Company. The firm has also taken up the sale of Buggies.

The Parcels Post Situation.

WASHINGTON, D. C., February 7, 1905.

OWING to a series of misunderstandings, the hearing before the subcommittee of the House Post Office Committee on the Henry bill, providing for the consolidation of third and fourth class matter at 8 cents per pound, widely advertised by the Postal Progress League to take place last week, was not granted, Chairman Gardner of the Subcommittee on the Revision of the Laws being absent from the city on the date set. Subsequently Mr. Gardner suggested that the purpose of the Postal Progress League might be equally well served if its secretary would file a brief, and this course was finally taken by Mr. Cowles, although with evident reluctance. A further effort will be made for a hearing, and the representatives of the league assert confidence in their ability to secure the desired legislation at this session, pointing to the fact that all such "progressive" measures have been enacted in the closing hours of Congress.

The Absurd Plea of Stupid People.

The brief submitted by the secretary of the Postal Progress League is a virtual admission of all the important allegations regarding this feature of the postal "reform" movement that have been made by its opponents. The chief contention is simply that there are a few stupid people in the country who are unable to tell third-class from fourth-class matter; therefore these two classes should be consolidated. Just why these classes after consolidation should not pay 16 cents per pound, rather than 8 cents, does not appear at all from Mr. Cowles' brief, though perhaps the mail order houses could give a reason. With characteristic industry Mr. Cowles has succeeded in digging up an important fact, quite generally overlooked in these discussions, but which hardly contributes to the force of his argument. Reviewing the postal legislation of the past 30 years he reminds the subcommittee that the comprehensive postal act of 1872 placed a rate of 8 cents per pound on merchandise, but that after an experience of three years the law of March 3, 1875, was passed, which by inserting the word "ounce" in lieu of "two ounces" increased the rate on both printed matter and merchandise to 16 cents per pound. Continuing, he says:

> The publishers and dealers in books seem to have been the first to appreciate the burden of this increased postage, and evidently in their interest section 16 of the Postal appropriation act of July 12, 1876, provided that on all printed matter of the third class, including transient magazines and newspapers, the rate should be 1 cent for two ounces, the old rate of 1872 and 1874. This brings us down to the act of 1879 and the present fourfold system of mail classification. This fourth class seems to have been added solely in order to keep the rate on merchandise at 16 cents per pound.

Here then is a very frank confession on the part of the secretary of the Postal Progress League that Congress, after a three years' experiment in carrying merchandise at the rate of 8 cents per pound, deliberately increased the rate to 16 cents, but subsequently recognizing the unquestioned right of printed matter to a lower rate than merchandise, restored the 8-cent charge on third-class matter and created the fourth class, which, as Mr. Cowles admits, "seems to have been added solely in order to keep the rate on merchandise at 16 cents per pound." Mr. Cowles asserts that the *résumé* of postal legislation presented by him proves conclusively that the Henry consolidation bill "is not new legislation, but is only a revival of the law of 1874 and a return to its comparative simplicity."

Why Officials Favored the Consolidation of Rates.

To bolster up this proposition Mr. Cowles quotes the reports of various postal officials, the majority of which are in favor of consolidation, but he makes it perfectly apparent that while the plan has been favored from time to time solely for administrative reasons, and in aid of the minority of stupid people who occasionally use the mails, the objections to the project are based on the important principle that it is not a proper function of the postal service to transport merchandise. After referring to the suggestion of Postmaster General Wanamaker that the distinctions between the two classes of mail matter were sometimes "shadowy," he cites a symposium of expressions from 32 of the leading postmasters of the country, including New York, Philadelphia, Boston, St. Louis, Baltimore, Pittsburgh, Cincinnati, Cleveland, Detroit and Chicago, "all of them, with the single exception of Mr. Van Cott of New York, supporting Mr. Wanamaker's recommendation." Mr. Van Cott, he says, "opposed the transportation of merchandise in any form by the post office, and therefore opposed any legislation that would reduce the merchandise rate."

This is highly signficant. It should be remembered that Mr. Wanamaker, looking at the matter from the standpoint of a merchant doing a colossal business, with a gigantic mail order department, concluded that it would be a good thing to consolidate third and fourth class mail matter. He thereupon called upon the leading postmasters of the country for an expression of their views, and, like a flock of sheep, they hastened to get into line with the head of the Department. Mr. Van Cott was the sole exception, but when the situation is understood it will be admitted that his evidence outweighs that of all the other postmasters combined. He is conceded to have been one of the ablest postmasters that New York has had in more than a generation. His office transacted more business than the aggregate of all the other offices mentioned, and he therefore knew what he was talking about when, in defiance of the well-known views of his official chief, he gave it as his opinion that the mails were not intended for the transportation of merchandise. It must be conceded that Mr. Van Cott did honor to himself and to the postal service, and Mr. Cowles is entitled to a vote of thanks for resurrecting these facts and bringing them to the attention of Congress and the public.

A Timely Warning to Retail Merchants.

Coming down to more modern times Mr. Cowles refers to the fact that "in each of his reports for the past six years Third Assistant Postmaster General Madden has reiterated the demand made by Mr. Wanamaker and the United States postmasters away back in 1889." He refers to the perfunctory indorsement of General Madden's plan by Postmaster General Payne, and he then quotes at length the statements made by General Madden and Postmaster General Wynne in the reports submitted to Congress last December. In conclusion Mr. Cowles sums up the situation in the following significant language:

> Surely Congress cannot continue this confusion any longer. The revival of the old law of 1874, proposed by H. R. 15,283, consolidating third and fourth class mail matter, will be a fitting supplement to the legislation which this year extends our free rural service to 18,000,000 people.
>
> Is the last session of the Fifty-eighth Congress near its close? Practically all the progressive postal legislation of the last century has been enacted in closing days of an expiring Congress.

If the retail merchants of the country needed any warning with regard to the Henry consolidation bill they would find it in the sententious statement by Mr. Cowles that the passage of this measure "will be a fitting supplement to the legislation which this year extends our free rural service to 18,000,000 people." The merchants know how injurious has been the centralizing influence of the rural free delivery. Following out this proposition to its logical conclusion, it would appear that a domestic parcels post bill would be "a fitting supplement" to legislation extending the rural free delivery to the 50,000,000 people whom it will reach in a very few years, according to the expert prediction of one A. W. Machen, late Superintendent of Free Delivery, now under sentence to spend the next four years in the Moundsville Penitentiary. The merchants will also find another warning in Mr. Cowles' remarks to the effect that "practically all the progressive postal legislation of the past century has been enacted in the closing days of an expiring Congress." The Postal Progress League will stand watching during every day of the four weeks that will elapse before the present Congress adjourns *sine die*.

W. L. C.

THE LEGITIMATE HARDWARE DEALER.

To the Editor: Inasmuch as the various State associations of Hardware dealers are now holding their annual conventions, and there is such a strong sentiment that the Hardware jobbers should sell only the "legitimate" Hardware retailers, and the jobbers have taken up the cause and demand that the manufacturers sell their product through the "legitimate" Hardware jobber only, the question naturally arises, What constitutes a "legitimate" Hardware dealer?

When I Was a Boy

if one were in need of a clock, watch, spectacles, jewelry, diamonds, photo supplies, baby carriage, furniture, lamps, crockery, cut glass, mackintosh coat, fur coat, fur robes, blankets, lumber, wagon, carriage, machinery, harness, cigars, tobacco, &c., he would not have thought of inquiring of the Hardware dealer and much less have expected to obtain them at his store, yet to-day the above and scores of other items equally as foreign to legitimate Hardware form a regular part of many so called "legitimate" stocks.

During the past 30 years no class of merchants has added special lines to regular stock as rapidly as has the Hardware dealer, and can one blame the other class of merchants for adding light or profitable Hardware? Thirty years ago the sporting goods trade was almost exclusively in the hands of the sporting goods jobber and retailer; to-day the "legitimate" Hardware dealer—jobber and retailer—has more than nine-tenths of this trade, and has practically driven the sporting goods specialist out of business, only a few of the "old-timers" being left to struggle for an existence.

It is only quite recently that the Northern jobbers have added a full line of harness and saddlery goods, and what effect will this have on the legitimate harness trade? Still later the Hardware jobbers have added air tight Heaters, and from that a full line of Stoves, which had heretofore been sold by Stove makers almost exclusively direct to the retailer. As the jobber must have his Stoves under private brand the makers of well-known goods with an established reputation must protect their name and trade-mark, and they may find it necessary to go direct to the consumer.

Hardware and Lumber.

If the "legitimate" Hardware dealer continues to add new lines as rapidly during the next 10 years as he has during the past decade, his "legitimate" Hardware stock will be a veritable department store. There are more Hardware retailers carrying lumber as a side line than there are lumber dealers carrying builders' Hardware, yet we have all read in the trade papers of the Hardware dealers' denunciation of his local lumber dealer selling Hardware. I have known many Hardware retailers to refuse to buy goods of a Hardware jobber who sold builders' Hardware to the local lumber dealer, yet they were carrying goods absolutely foreign to Hardware. When the Hardware dealers make these demands of the factors they buy from and are themselves carrying everything under the sun they can profitably handle, does not their complaint or demand appear to a disinterested party as most foolish, unreasonable and absurd? It is a case of "you can't play in my back yard, but I will romp on your front lawn and even trample down your flowers if I choose."

The Hardware Associations

are grand educators. Every dealer should by all means belong to either the jobbers' or retailers' association. They accomplish much for their members, but when they undertake impossibilities or advocate and demand absurdities they hurt their cause more than they realize, and when they comment about Hardware being distributed through legitimate channels only, is it consistent unless they confine themselves to legitimate Hardware lines? As long as the Hardware dealer insists on carrying foreign lines just so long will other dealers carry light Hardware, Tinware, &c., and usually make a leader of the same.

Suppose the retailer should succeed in persuading the jobber to refrain from selling other than the association "legitimate" Hardware dealer, does any one imagine for a moment it would hamper the department store, the druggist, the butcher or candlestick maker from obtaining all the Hardware they wanted? This policy would be a "godsend" to houses jobbing goods by catalogue, which exist in every jobbing center, and which are to-day doing more to build up mixed merchandising in small towns than anything else, yet the "legitimate" Hardware dealers patronize them in a small way, not seeming to realize that this class of jobber is the principal source of supply for the racket store, the 5 and 10 cent store and the small department store.

Unless the "legitimate" Hardware dealers confine their business to legitimate Hardware they make themselves appear foolish, selfish and dictatorial even to discuss the subject as they have done in the past. To advocate that others do what they refuse to do is the hight of folly and if continued on other lines with demands as inconsistent would result in the downfall of their association.

ED. FORD.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Should Cold Chisels Be Sold by Weight?

From a Manufacturer: The manufacturers of Cold Chisels as a general thing sell them by the pound, which we do not believe is the way tools should be marketed. We sell ours by the dozen, making them of standard diameters and lengths, from which we do not deviate, so that our customers can rely on getting Chisels of uniform sizes, and if to-day a dozen ¾-inch Chisels weigh 12 pounds, and are ordered again 12 months from now, they will be of same weight. When bought by weight merchants often have difficulty in educating the manufacturer to make them of uniform lengths and thicknesses. They start out and figure selling price on having ¾-inch Chisels 7½ inches long, but inasmuch as the more steel the maker puts into a dozen Chisels the more profit he would make it is found that in many instances they are selling Chisels at practically cost, for without this knowledge the manufacturer would make them 8 and 8½ inches long. He sold them by the pound, so he was sure of his profit. The merchant sold them by the dozen, on the basis of 7½ inches long, and he was out the difference on weight of 1 inch on each Chisel. This, we believe, is the experience of most of the dealers, and we have sufficient evidence in the way of orders to show that our method of putting them up is the proper one.

Cold Chisels are one of the items about which the manufacturer as a rule asks, "How much do you want to pay?" If the dealer says 8 cents per pound, the manufacturer will find a grade of steel that he can work up so as to leave him a profit. The result is that in most cases where Chisels are sold at these extremely low prices they are made of machinery steel instead of tool steel.

What the Balance Sheet Reveals.

From a Merchant in Pennsylvania: The advent of a new year is looked forward to with anxiety by many business concerns on account of the showing the balance sheet will make. It is a Mt. Pisgah from which a view can be had of the wanderings of the past year and reveals the rocks that lay thick in the pathway of business, and fortunate are we if we have been able to avoid them. From the same elevation with the mind's eye we may view the promised land, with its contemplated success, often forgetting that there are giant obstacles ahead to be overcome before we can enjoy the satisfaction of success; but the pleasure is all the more enjoyable when strenuous efforts are necessary to achieve it.

The first and perhaps the most formidable giant is sharp competition. Like the onrolling wave it perhaps threatens disaster, but like the wave disappears, leaving only a little streak of foam on the shore.

Another enemy, and almost as relentless as the first named, is the giant of Overconfident Ease. A brilliant success in the start is apt to puff us up, so that we relax our efforts and recline on our oars, forgetting that unless we are constantly pulling at the oars our boat is dropping down the stream and may be stranded on the rocks below. If, therefore, we would make a continued success of business we must be constantly on the alert to overcome the numerous bars that obstruct the path.

Nothing to Fear from Catalogue Houses, If—

From a Well-known Manufacturer: We do not sell catalogue houses, but we are of the opinion that quantity should regulate prices, and that if the retailer would dress up his store better, advertise locally and go after trade he would not have much to fear from the competition of catalogue houses.

JOBBERS' BRANDS: REASONS FOR, OBJECTIONS TO, AND THE REMEDY.

THE problem of jobbers' brands is unquestionably one of a good deal of difficulty. The practice of making special brands is so thoroughly established in some lines that the manufacturers are kept in the background, so that the trade are scarcely aware of their existence. Even where the matter is not carried to this extreme it still involves hardship to the producers of goods, and in many cases injury to the best interests of the merchant and consumer. In view of the practical importance of the subject the following statement of the case, for which we are indebted to F. S. Kretsinger, president of the American Fork & Hoe Company, will be of interest as taking a broad and reasonable view of the questions involved:

The jobbers desire the application of their names or brands to goods:

First. That they may be practically independent of the maker and have the same articles made at any time by any competitive manufacturer who will offer inducements, which are generally made in prices and not infrequently are for a quality inferior in some respects.

Jobbers' Reasons

Second. That they may make a better profit, for they can have their names or brands applied to second or third grade or at least to off colored goods, and either sell them as first grade or sell them on their own merits, notwithstanding they may be inferior in quality, in weight, in size or in finish, as the case may be.

The objections on the part of the manufacturer to the custom of selling his goods put out under the jobbers' brands are great and serious, assuming that neither his name nor trade-mark is applied to the goods. To the extent that he sells his products without his name or trade-mark, but instead uses the jobber's name or mark, just so much does he lose their advertising value, and to this extent does he weaken his hold upon the trade; and did he omit his name from all of his goods and instead apply that of the jobber he would have no standing before the buying community generally, no matter how many years he might be in business. The custom discourages the introduction of new goods in the way of distribution of catalogues and samples, by advertising in trade and other papers and in the use of circulars. The result may be some desirable orders, but there are no lasting results. He has not obtained a foothold with the general trade, is not even certain of subsequent orders, but rather for this one season's business has placed his plant at the disposal of some customers and built up a demand for brands over which he has no control.

Objection No. 1.

Another objection is the extra cost. His warehouses may be full of his regular brand of goods for the prompt execution of orders, but an order with a special mark cannot be filled from this stock, but the goods must be specially made, and the order must have special attention and care from the time the sale is made until the shipment is paid for. Every one in the office handling such an order, the superintendents of the various departments of the factory, the warehouse men, the shipping and invoice clerks, each and every one must give this order particular attention and must be paid for it, too. The goods must be marked by brand, stencil, label or otherwise, and kept separate and apart from other goods, until they leave both the shop and the warehouses. In many instances orders call for small quantities of certain articles or sizes; these, as is well known, cannot be made economically.

Objection No. 2

The jobber's brand may work a serious injury to the manufacturer in another way, and he is helpless to defend himself. For instance, a jobber buys a line of first-class goods of a maker whose name and brand stand very high for quality, and through his traveling salesman and otherwise this jobber finds it necessary or advantageous fo disclose to his customer the name of the maker—it aids in effecting a sale which possibly otherwise could not be made. The following season Mr. Jobber is induced by a cut in price or terms to buy from another manufacturer. The goods have not the same high reputation as those formerly bought, or may even be known as inferior, but he takes his chances, relying largely on his own name or brand to sell the goods. Does the jobber or his salesman inform the customer of the change in the source of supply, or is he left to suppose that no change has been made in this respect? Despite contract conditions and promises the goods prove inferior to those heretofore purchased. The difference is noted by the retailers, complaints are made, and the difficulties are adjusted in some way; but where does the odium rest? Has not the maker of high grade goods suffered in reputation?

Objection No. 3

There is another objection to continuing the custom, and this is of interest to all jobbers and retailers as well as the manufacturers. There is a considerable element of danger in that it will enable and encourage syndicate buyers, retail catalogue houses and department stores to adopt the same plan, through which the manufacturer can conceal his transactions with such houses, and a worse condition might be engendered than now confronts the trade.

Objection No. 4

Will it not also encourage the manufacturers of certain lines to pass the jobbing trade and seek the retail trade direct? In fact, the manufacturers of some articles might seek, and in some instances could better afford, to sell consumers direct!

The custom may properly be classed as an evil one, and the question is, What is the remedy? The most effective one is to discontinue the practice entirely unless the manufacturer's name appears with that of the jobber.

The Remedy

Another form of relief is to require the jobber to assign his brand to the manufacturer, the manufacturer in turn agreeing not to use it for any other customer. And then in all cases a charge should be made to fully cover the cost of the additional marking and all the details pertaining to the execution of the order.

M. S. BENEDICT MFG. COMPANY.

THE M. S. BENEDICT MFG. COMPANY has closed its plant at Ottawa, Ill., and most of its 100 employees and their families will move to Syracuse and East Syracuse, N. Y. All of the equipment from the Ottawa factory, with the exception of the power plant, will be moved to East Syracuse and placed in a new factory building which is rapidly nearing completion. The new plant at East Syracuse is of frame, slow burning construction, 55 x 100 feet in dimensions, and two stories high above the basement. The company expects to have the plant ready for operation next month. An effort is being made by the Benedict Company to consolidate its interests at East Syracuse, and during the past two years extensive additions have been made to the plant. We are advised that orders are coming in freely from all parts of the country and that the outlook indicates the biggest year in the company's history.

Iowa Retail Hardware Dealers' Association.

THE seventh annual convention of the Iowa Retail Hardware Dealers' Association was called to order at 11 o'clock on Wednesday morning in Commercial Hall, Des Moines, President Miles in the chair. The attendance approximates 300 members. The following convention committees were appointed:

RESOLUTIONS: Messrs. Kingsbury of Osage, Bollinger of Afton, Carstens of Ackley.

PRESS: Messrs. Lindenberg of Dubuque, Doty of West Liberty, Sale of Mason City.

NOMINATIONS: Messrs. Millard of Cherokee, Stouffer of Iowa City, Sobolik of Cresco.

QUESTION BOX: Messrs. Nichols of Burlington, Keating of Mt. Ayr, Woodruff of Correctionville.

AUDITING: Messrs. Keating of Afton, Rogers of Britt, Vieth of Oakland.

ENTERTAINMENT: Messrs. Gadd of Des Moines, Garver of Des Moines, Vincent of Ft. Dodge.

D. H. Hueston of Jefferson was chosen sergeant-at-arms.

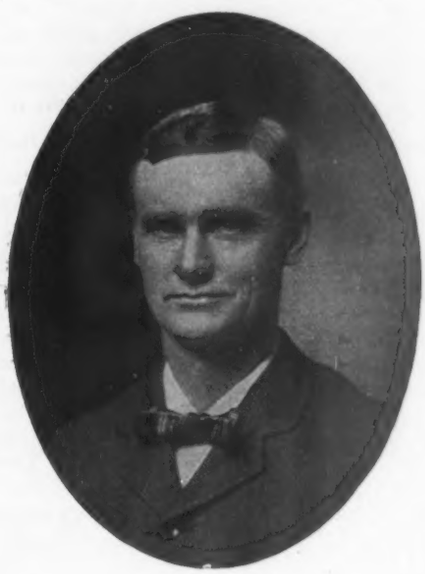
An unusually large number of exhibitors are represented in the corridors of the hotels with attractive displays.

President S. R. Miles' address, which will be a feature of the afternoon session, and a paper on the association by B. A. Hand of Ottumwa, are presented in the following columns.

Presidential Address.

BY S. R. MILES, MASON CITY, IOWA.

It is with sincere pleasure that I meet and greet you at this our seventh annual convention. The year we have



S. R. MILES.

just left behind was in many ways one of the most notable in the history of Hardware association work.

For years a campaign of education has been waged by the national and the various State associations with the Hardware jobbers and manufacturers of the country to convince them of the injustice that their methods of marketing a comparatively small portion of their various lines was working to the retail Hardware dealer, on whom they depend to market the larger per cent. A number of jobbers and manufacturers have for years recognized the justice of our claims, and, having foreseen what a continuation of the marketing of Hardware through some channels that had come into existence in recent years would lead to, were confining their business to what may be properly termed legitimate trade channels; but it was left to 1904 to bring to our way of thinking a number of prominent jobbers as well as manufacturers.

I am glad to be able to say to you to-day that nearly if not quite every Hardware jobber in the United States has gone on record as against selling any concern that sells direct to consumers by the means of catalogues only, and I believe these jobbers mean what they say, and if the retail Hardware dealer will take the same stand, one of the most serious problems that confront us will be much nearer solution than ever before.

JOINT COMMITTEE.

Largely as a result of this general awakening on the part of prominent jobbers on June 27, 1904, there gathered at St. Louis three committees, appointed by their respective associations, five members of the National Retail Hardware Dealers' Association, five members of the National Hardware Association and one member of the Southern Hardware Jobbers' Association.

The purpose of this gathering was to discuss the advisability of forming a permanent committee to take up one question—that of catalogue house competition as it effects the legitimate distribution of Hardware. After a thorough discussion of the subject a committee of the whole was organized under the name of the Wholesale and Retail Joint Committee. A platform was adopted and active work begun by correspondence and personal interviews, and with highly satisfactory results.

November 10 to 12 another session of the Joint Committee was held in New York City. At this time personal interviews were held with a large number of prominent manufacturers, and the question of how the output of the manufacutrer should be marketed was thoroughly discussed. Good results have already followed this meeting and will continue indefinitely.

As there will be a full discussion of the work of this committee during this session, I will not take up your time further than to say that I feel that the Iowa Association was paid a high compliment in having its president named as a member of this one of the most important committees ever appointed in the history of Hardware association work, and I count myself fortunate indeed to have been president of the Iowa Retail Hardware Dealers' Association at that time.

NATIONAL ASSOCIATION.

As one of the delegates I attended the meeting of the National Association at Indianapolis in March. There were delegates in attendance from every State affiliated with the National Association. The National might be called a clearing house for the various State associations. All of the principal subjects discussed at the various State meetings are taken up and thoroughly sifted and boiled down in shape for action, and results obtained during the past year clearly indicate the activity of the National officers and directors and the wisdom of the various State organizations in combining their efforts under one head. This National body, by its wisdom in the selection if its officers, has come to be recognized as one of the leading factors to-day in the work of correcting some of the many evils that have crept into the legitimate distribution of Hardware. Those in charge of the executive work of the association, early realizing that only by sane, conservative methods could anything be accomplished, laid their foundations wisely and well. Having laid down a line of action, they have hewn strictly and persistently to the line, letting the chips fall where they would.

The National Association will continue to grow in strength and influence, and the large increase in the membership of all State associations during the past year and the ever increasing interest on the part of the membership in association work certainly make the future outlook bright.

PARCELS POST.

One of the important questions with which the National Association has had to deal is the parcels post. Early recognizing the dire results that would follow not only to retail Hardware dealers, but to the entire legitimate retail interests of the country, the enactment of a law by Congress that would enable any one to send by mail to any part of the United States 11 pounds of merchandise for 25 cents, National President Bogardus and Secretary Corey have been untiring in their efforts to prevent the passage by Congress of any such measure, and to them belongs a very large measure of credit; but I can assure you that the enemy, while disconcerted for a time, has not given up the fight. They are now working to get through Congress various measures, seemingly innocent in themsives, but if passed by Congress would prove an entering wedge for further legislation, and I trust that every Hardware dealer in Iowa as he may be called on from time to time to assist as he can in the prevention

of the passage of a parcels post law in any form will respond promptly to the call.

MUTUAL INSURANCE.

A year ago I took occasion to congratulate this association on the wisdom displayed in the organization of the insurance department. The passing of another year only confirms the wisdom of this action, the volume of business being to-day nearly two and one-half times that of last year. While this is a satisfactory showing, your officers and directors are not content to rest on their laurels, but have outlined a campaign for 1905 that should place at least $1,000,000 of business on the company's books before the close of another year. A refund of 25 per cent. has been declared on all policies expiring after February 15, 1905, and prior to March 1, 1906. The amount that can be written in one policy was increased from $2000 to $3000. This will enable you to carry at least $1000 additional insurance in your own company. There are, in round numbers, 1700 Hardware dealers in Iowa. Should each dealer take a policy for $2000, we would have the handsome sum of $3,400,000. The benefits to be derived by carrying a part of your insurance in this company must not be based entirely on the size of your refund. In a number of instances a suggestion on the part of a member that he had about concluded to place a part of his insurance with the Hardware company has been the means of securing for him a lower rate on the entire amount of his insurance. Just in proportion as the business of the company grows, just in that proportion will its ability to serve its policy holders be increased. If you are not already a policy holder in the Iowa Hardware Dealers' Mutual Insurance Company, consult your own best interests and make application to-day.

CHANGING CONDITIONS.

Only in recent years has organization been considered necessary or in any way beneficial. That it is now both leads to but one conclusion, and that is that business conditions have changed.

The business of the retail Hardware dealer has been subject to more inroads by merchants in other lines than any other branch of mercantile business. To-day you will find in the grocery store Tin and Galvanized and Enameled Ware; at the house furnisher's, Stoves, Kitchen Utensils and various Hardware specialties; in the drug store, Cutlery, Fishing Tackle and a general line of Sporting Goods; at the lumber yard, Field Fencing and oftentimes Nails and Builders' Hardware; at the tea and coffee store, a full line of Enameled Ware to be given away as prizes, and at the racket store, or more generally called the 5 and 10 cent store, a full line of the little items which at one time were a profitable part of our business.

Are we as Hardware merchants not somewhat at fault? Have we not been too slow in taking up and pushing new lines of goods that properly belong in a Hardware store? Have we paid sufficient attention to the little things in our stores? If merchants have grown rich selling 5 and 10 cent goods, mostly Hardware and Tinware items, surely a 5 or 10 cent department in our stores is at least worthy of consideration. As the trade in one department of our business after another has fallen off the expense has gone merrily on, increasing to an almost alarming extent each year, despite our efforts to keep it down. Surely business conditions have changed. Is there a remedy?

It is an encouraging fact to note that many Hardware dealers, realizing the necessity of protecting their interests, have added a first-class 5 and 10 cent department, have secured the agency for some first-class Field Fence, are selling Stoves on the installment plan at a handsome increase in their profits, and are finding that paints and painters' sundries, garden seeds, harness and various other lines can be carried with profit. More complete stocks are being carried, more attention being paid to the arrangement and display of their goods. Show windows are kept clean and the goods in them arranged to attract attention. Advertising methods are receiving more attention, with highly satisfactory results.

Given time there is no question but the retail Hardware business will be put on a more satisfactory profit bearing basis.

BENEFITS OF ORGANIZATION.

Has it ever occurred to you to give the annual meetings of this association credit for bringing you to a realizing sense of the changed conditions that exist? And is it not true that these various meetings have been to many of us valuable schools of instruction? Those actively engaged in association work have long recognized the necessity of employing a secretary who could devote his entire time to association work; the organization of the insurance department made it possible for the first time for the association to do this. Mr. Sale was at the close of the meeting last February elected secretary and treasurer of this association, having already been elected secretary of the Insurance Association. The wisdom of combining the office of secretary in the two associations will be fully proven when you know there has been an increase of more than 175 members since the last meeting and the convening of this one. The report of the secretary-treasurer will show the affairs of the association to be in highly satisfactory condition.

I wish to assure you of my appreciation of the many kindnesses shown me during the past year by dealers, both in the association and out, and to thank the officers and directors for their loyalty to me and to the association. It has assuredly been an honor of which any man might feel proud to have been the presiding officer of this, one of the strongest and best of all the State associations, and an association that I predict will in the future be looked to more and more to furnish a solution of some of the many evils that have crept into the Hardware business, but which must succumb to the enthusiastic and persistent efforts as put forth by the various retail Hardware dealers' associations.

Why I Am a Member of the Iowa Retail Hardware Dealers' Association.

BY B. A. HAND, OTTUMWA, IOWA.

The tendency of modern business is along the lines of consolidation and co-operation. A few years ago I began to observe the methods of the manufacturing and large commercial concerns of this country in their business relations with the retail dealers. As a result of my observation I soon noted that a very marked and significant change had come about in that competition was gradually giving way to steadfast and uniform prices on all commodities. In the beginning it was thought that the trusts would not endure very long; that they were of ephemeral growth; that they would fall to pieces of their own weight, and that the days of former competition would return with redoubled force and effect. But not so; the results were satisfactory to the trusts and they have been and I believe will be perpetuated, however injurious and offensive they may be to the public. If unrestricted, centralization of wealth is inevitable. I believe the trusts as organized and managed to-day are vicious in their tendencies and detrimental to the best interests of the general public.

I call your attention to the results of these gigantic organizations to illustrate the power and effect of organization, for good or bad depending on the sentiment prevailing in the body of the organization. There may be two motives for organization—one for self aggrandizement, as is apparent in many of the trust organizations, and the other for self preservation. We belong to the latter class. We have pursued a cutthroat policy too much in our business relations with our brother dealer. Many of us have not followed the

LIVE AND LET LIVE POLICY,

but have exhibited our selfishness in our business relations every week in the year, all the time treasuring the thought that our competitor is after our scalp and that we will sell this particular bill of goods and get revenge, although we shall make no money in the transaction.

Brother dealers, did any of you ever make a sale in the spirit of competition? If you did and follow up this line of action you will never be a millionaire. This is nonsense. Your brother dealer is just as good a fellow as you are, is in business for the same purpose, has a

family to support, taxes and rent to pay; and wants to lay something by for a rainy day and old age. You don't know him, although he be in the same block, unless you have a local organization, at which you meet and talk over affairs with a view to being mutually benefited. When you invoiced you had to run to profit and loss $200 or $300. Open up and tell your brother competitor the names of the deadbeats, and he, in turn, will do the same. Get nearer together, get together not to rob the customer, but to get legitimate prices and banish ill feeling. The progressive, up to date, successful merchant of to-day is the one who mingles with others, is the one who knows what the rest of the world is doing and takes part with them.

ORGANIZE LOCALLY.

In many localities I think the cart has been placed before the horse. The dealer belongs to the State Association, with no local organization at home. The progressive and profitable course to pursue is to organize locally, where it is convenient to meet once a month and spend an hour or two socially combined with business and then round up the year with a big annual State meeting. If the State was organized locally you could depend on a largely increased attendance at the annual meeting. These State associations are what we need, finding their complement in a strong and vigorous national body. Bound together in such a manner the National Association can show the doubtful manufacturer

B. A. HAND.

or jobber that there is a strong body of intelligent retailers ready to act if necessary to protect their own interests.

MUTUAL INTEREST.

Our interest and that of the jobber and manufacturer is a common one, although some of the manufacturers do not seem to see it that way, and it is our duty and privilege to show them the light. I want to ask where the sales of some of the standard lines of Hardware would be in a few years if left to the catalogue houses? Notice in any of their catalogues the conspicuous place given inferior goods and the effort made to convince people that they are just as good as some well-known brand.

A very large list of manufacturers, in sympathy with our efforts and disgusted with catalogue house methods, has been compiled by the National Association, and it is well for us to look it over. The number has been increasing each year, for they see the earnest effort we have been making and realize that it is for their good as well as ours.

To a young man like myself it means much to meet in council with such men as gather here from year to year—men eminently successful in Hardware and other lines; men who are big enough and broad enough to give us the benefit of their knowledge and experience freely and willingly; men who are fully capable of handling their own affairs, however complicated, and yet have time to be highly interested in the welfare of the community in which they live, giving their time and money when necessary for the public good. I have never failed to go home from one of these meetings without being full of enthusiasm for the possibilities of the Hardware business, and have utilized things that I have heard here in our own business to great advantage. I have gained in dollars and cents as well as knowledge from my yearly attendance. It has placed me in closer touch with Hardwaremen and the Hardware business, causing me to realize how little I knew, and made me eager to learn more.

MONEY MAKING RESULTS.

Perhaps it might be well for me to state here how I have obtained results from what I have heard or learned at these meetings. Last year some one told of the possibilities of the Washing Machine business. Following the suggestions made, we sold more than four times the number of machines we had sold in any previous year. The same policy was followed in our Wire Fencing, and sales were much larger for the year. I got the idea from an article read here on how many miles of fencing would have to be used before Iowa was properly fenced. Two years ago we followed the suggestions offered on Sewing Machines and have never had reasons to regret it. These results were obtained by larger stocks and a more varied assortment and not by any price cutting. In fact, the price was advanced on many of these lines. Many such ideas, too numerous to mention, have been acted on, always with good results.

The fire insurance feature of this organization commends itself to any thinking person and can be used by any member. This means that this association will pay any Hardware dealer enough money for a three days' attendance here each year if he will become a member. I know of no stronger argument than this insurance plan.

The opportunity to meet new people and renew acquaintances is too good to be lost and is really one of the things that make life worth the living.

J. M. WARREN & CO.'S FIFTIETH ANNIVERSARY.

FEBRUARY 1 was a red letter day in the history of J. M. Warren & Co., the well-known Hardware and Iron house of Troy, N. Y. It was the fiftieth birthday of the concern under its present name, although the business to which J. M. Warren & Co. succeeded dates back nearly 100 years, Hart & Nazro, established in 1809, being the first proprietors Following them came Isaac B. Hart; Craft, Hart & Pitcher; Pitcher, Hart & Card; Hart & Card; Hart, Lesley & Warren; Warren, Hart & Lesley, and finally J. M. Warren & Co. in 1855, composed of Joseph M. Warren and Charles W. Tillinghast, the latter member of the house to-day representing more than 60 years of consecutive association with the business.

In 1870 the firm erected the spacious five-story brick building now occupied by it on the southwest corner of River street and Broadway. On Feb. 10, 1887, the then proprietors of the business, Joseph M. Warren, Charles W. Tillinghast, Joseph J. Tillinghast, C. Whitney Tillinghast, 2d, Frederick A. Leeds, H. F. Wood and H. S. Darby, became an incorporated body under the name of J. M. Warren & Co. The present officers are: President, Charles W. Tillinghast; vice-president, C. Whitney Tillinghast, 2d; secretary and treasurer, Henry S. Darby.

THE annual meeting of Landers, Frary & Clark, New Britain, Conn., held February 5, resulted in the election of the following Board of Directors: James L. Howard, Henry E. Russell, Charles F. Smith, George M. Landers, Andrew J. Sloper, Lucius A. Barbour, Henry C. Judd, John H. Whittemore and Francis R. Cooley. The directors elected the following officers for the ensuing year: President, Charles F. Smith; secretary and treasurer, George M. Landers; assistant treasurer, Frederick A. Searle; assistant secretary, James N. Stanley. Mr. Searle and Mr. Stanley have been connected with Landers, Frary & Clark for some years, and the directors have recognized their services by appointing them to their new positions.

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PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

SAUNDERS AUTOMATIC SASH LOCK COMPANY, 401 Keith & Perry Building, Kansas City, Mo.: Catalogue illustrating and describing Saunders' Automatic Sash Lock.

GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, Wis.: Unique "Pantry" calendar devoted to High Grade Enameled Ware, including American Blue and White, Cream City Gray and Opaline.

COLDWELL LAWN MOWER COMPANY, Newburgh, N. Y.: Artistic framed illustration, directing attention to the Coldwell Lawn Mowers.

KEYSTONE WIRE MATTING COMPANY, Beaver Falls, Pa.: Circulars illustrating Mats and Matting. These are made of crimped, flat galvanized steel strips, hinged together with galvanized steel rods, admitting of their being rolled up like an ordinary piece of straw matting. The manufacturer explains that they are reversible, cannot warp or curl at the sides or edges, lie flat, scrape shoes in every direction and are self cleaning.

HOPKINS BROTHERS, SPRINGER COMPANY, Des Moines, Iowa: Printed matter relating to Brazol, a compound for brazing Cast Iron, Steel, Iron, Malleable Castings and Cast Steel. Among the articles which can be brazed with the compound are the following: Farm and Printing Machinery, Washing and Ice Machines, Stove Repairs, Iron Beds, Elevator and Mill Castings, Cast Models, Wind Mills, Auto Cylinders, Lawn Mowers, Hardware, Gas Engines, Cylinder Heads, Radiators, Cast Iron Pipe, Plumbers' Supplies, Motor and Chair Castings, Mine Machinery, Bicycle Parts and all kinds of Machine Tools. One of the advantages arising from the use of Brazol is the saving of the time and expense of getting new parts.

THE INTERNATIONAL COMPANY, Columbus, Ohio: Illustrated catalogue relating to Hallwood Cash Registers and Short Credit System. Cash Registers in a variety of styles and finishes are shown, also Index Cards in connection with the Hallwood Business system, designed for use in connection with the Cash Registers.

THE BROMWELL COMPANY, Cincinnati, Ohio: Illustrated catalogue devoted to Brushes, Household and Garden Wire Goods, Bird Cages, Bright Wire Goods, Elevator, Bank and Stable Wire Work; Wire Cloth, Netting and Wire.

WESTCOTT CHUCK COMPANY, Oneida, N. Y.: Catalogue devoted to Westcott's Patent Lathe Chucks, Little Giant and Oneida Drill Chucks, Center Arbors for Westcott's Chucks, &c.

A. MUGFORD, engraver and electrotyper, 136 Liberty street, New York: Calendar for 1905.

POPE MFG. COMPANY, Eastern Department, Hartford, Conn.: Illustrated catalogue relating to Columbia, Hartford and Vedette Bicycles for 1905.

THE SIDNEY STEEL SCRAPER COMPANY, Sidney, Ohio: Catalogue No. 9, showing some lines which have been added since the issue of the company's last catalogue. Illustrations are given of Wheeled and Drag Scrapers, Grading Plows, Four-Wheeled Trucks, Metal Tray Wheelbarrows, Baggage, Brick and Garden Barrows.

THE JAMES H. WATSON ESTATE, Crawfordsville, Ind.: Illustrated printed matter relating to the Anderson Twin Rake, with sheet steel ribbed head, having straight wire teeth on one side for soil and curved wire teeth on the other side for lawn purposes.

THE FOWLER NAIL COMPANY, Seymour, Conn.: Calendar calling attention to Vulcan Horseshoe Nails.

THE JOHNSTON HARVESTER COMPANY Batavia, N. Y.: Illustrated catalogue relating to Grain and Corn Binders, Headers, Mowers, Rakes, Tedders, Disk Harrows, Disk Cultivators, &c.

HARDWARE ORGANIZATIONS.

The following conventions of State Retail Hardware Associations will be held during the next few weeks:

COLORADO RETAIL HARDWARE DEALERS' ASSOCIATION:
Third annual meeting, February 14 and 15, Denver. Headquarters, The Adams. Membership, 125. President, A. L. Branson, Trinidad; secretary, F. C. Moys, Boulder.

KENTUCKY RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION:
Fifth annual meeting, Louisville, February 14 and 15. Headquarters, Galt House. President, J. C. Frederick, Owensboro; secretary, John R Sower, Frankfort.

ILLINOIS RETAIL HARDWARE DEALERS' ASSOCIATION:
Seventh annual meeting, February 14, 15 and 16, Peoria. No official hotel headquarters. Sessions at Turner Hall. Membership, 300. President, C. H. Williams, Streator; secretary, L. D. Nish, Elgin.

PENNSYLVANIA RETAIL HARDWARE DEALERS' ASSOCIATION:
Fourth annual meeting, February 21 and 22, Harrisburg. Membership, 200; gain since last meeting, 65. President, Joseph M. Selheimer, Lewistown; secretary, J. E. Digby, McKees Rocks.

INDIANA RETAIL HARDWARE DEALERS' ASSOCIATION:
Sixth annual meeting, February 21, 22 and 23, Indianapolis. Headquarters, Denison Hotel. Membership, 425; gain since last meeting, 48. President, E. M. Bush, Evansville; secretary, M. L. Corey, Argos.

MISSOURI RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION:
Seventh annual meeting, February 21 and 22, St. Joseph. Headquarters, Commercial Club. Membership, 160. President, Taylor Frier, Louisiana; secretary, Fred. Neudorff, St. Joseph.

MINNESOTA RETAIL HARDWARE ASSOCIATION:
Ninth annual meeting, February 23, 24 and 25, Duluth. Headquarters, Spalding Hotel. Sessions in Lyceum Theatre. Membership, 600. President, A. T. Stebbins, Rochester; secretary, M. S. Mathews, Boston Block, Minneapolis.

OHIO HARDWARE ASSOCIATION:
Eleventh annual meeting, February 28, March 1 and 2, Dayton. Headquarters, Algonquin Hotel. Membership, 325. President, John F. Baker, Dayton; secretary, Frank A. Bare, Mansfield.

CONNECTICUT RETAIL HARDWARE DEALERS' ASSOCIATION:
Second annual meeting, March 7, Hartford. Headquarters, Hotel Hartford. President, W. A. Church, Derby; secretary, James De F. Phelps, Windsor Locks.

NEW YORK STATE ASSOCIATION OF RETAIL HARDWARE DEALERS:
Third annual meeting, March 7, 8 and 9, Buffalo. Headquarters and meeting at Hotel Iroquois. Membership, 175. President, John G. Ferres, Johnstown; secretary, John B. Foley, Syracuse.

CALIFORNIA STATE RETAIL HARDWARE ASSOCIATION:
Fourth annual convention, March 8, 9, 10, San Francisco. Headquarters, St. Francis Hotel. Membership, 365. President, O. F. Sites, San Francisco; secretary, Henry Gracey, 235 Powell street, San Francisco.

NATIONAL RETAIL HARDWARE DEALERS' ASSOCIATION:
Minneapolis, Minn., March 14, 15 and 16.

NEW ENGLAND RETAIL HARDWARE DEALERS' ASSOCIATION:
Twelfth annual meeting, March 15 and 16, Boston. Headquarters, Hotel Vendome. President, John H. Sayward, Haverhill; secretary, F. Alexander Chandler, 36 Federal street, Boston.

St. John Iron and Hardware Association.

The eleventh annual dinner of the St. John Iron and Hardware Association of St. John, N. B., was held on the 25th ult. at the Union Club. A round of toasts and speeches followed the dinner. W. S. Fisher proposed a toast to "Our Association," which was responded to by W. H. Thorne. The president next proposed "The City of St. John," which brought out speeches from Mayor White, H. B. Schofield and T. B. Robinson. A toast was proposed by J. J. Foot to "The Iron and Hardware Association." Speeches followed in response by W. S. Fisher, Geo. McAvity, Chas. McDonald and J. A. McAvity. The next toast was by M. E. Agar to "Our Guests," and was responded to by C. J. Coster and J. D. Hazen. "The Ladies," proposed by Colonel Markham, was responded to by H. J. O'Neil and Jas. Harrison. The dinner *menu* was issued in the form of a Padlock. The occasion was very creditable to the committee in charge, comprising A. M. Rowan, John J. Barry, J. A. McAvity and J. P. Macintyre.

New England Hardware Dealers' Association.

The Board of Directors of the New England Hardware Dealers' Association met at the Boston Merchants' Association Tuesday, January 31. Trade conditions and inventory schedules were discussed. Committees were appointed to complete the details of the first annual Hardware convention under the reorganization to be held March 15 and 16, with headquarters at Hotel Vendome. The convention idea for Boston is meeting approval on all sides, and three new members have been admitted since the last meeting of the board, making 31 new members admitted since the reorganization last summer. The association will be the guests of the Boston Automobile Dealers' Association on March 16, and attend the annual show.

California State Retail Hardware Association.

The fourth annual meeting of the California State Retail Hardware Association will be held at the St. Francis Hotel, San Francisco, on March 8, 9 and 10. Henry Gracey, secretary, 235 Powell street, San Francisco, writes as follows touching on the coming meeting and the work accomplished by the association:

This meeting will be of vast importance to every Hardware dealer in the State. We are exercising every means not only to have the largest gathering, but to put forth such efforts as will bring every dealer in the State into our association.

The past year has been a very prosperous one as a whole with our members, there being less complaints and grievances than in any previous year. We have established a price schedule throughout the State on all standard articles of Hardware, which we find is very materially doing away with unprofitable price cutting. The Hardware merchants in the different towns and cities in the State have got together and agreed to uphold certain retail prices on Hardware to the consumer to suit the conditions of their respective localities. These prices with few exceptions are strictly adhered to. This system originated with the San Francisco association several years ago and worked so successfully that the entire State has adopted it.

The California Association, through its various sectional organizations, now has a membership of 365 firms.

Idaho Hardware and Implement Dealers' Association.

The Idaho Hardware and Implement Dealers' Association has elected the following officers for 1905: President, James E. Clinton, Jr., Boise; vice-president, A. B. Moss, Payette; secretary, Geo. W. Fletcher, Boise; treasurer, E. A. Fraser, Ontario; Executive Committee, Messrs. Clinton, Moss and Fletcher, and V. C. Kerr, Boise, and S. W. Dee, Caldwell. At the recent annual meeting a committee was appointed to arrange for the drafting of a bill to be introduced in the Legislature prohibiting peddling.

Texas Retail Hardware and Implement Dealers' Association.

At the recent annual meeting of the Retail Hardware and Implement Dealers' Association of Texas, held at Dallas, the following officers were chosen for the ensuing year: President, S. L. Erwin, Honey Grove; vice-president, R. L. Penick, Stamford; secretary-treasurer, J. W. McManus, Waxahachie. Directors: T. T. Clark, Ennis; H. S. Allen, Calvert; W. A. Spangler, Bonham; D. B. McCall, Waxahachie; W. M. Gunnell, Charles Hutchins, San Marcos.

Ohio Hardware Association.

Frank A. Bare, Mansfield, secretary of the Ohio Hardware Association, in a letter dated 6th inst. touches on the Question Box feature of the approaching convention and the necessity for co-operation of dealers, as follows:

The Ohio retail Hardware dealer is doing some studying today. He realizes new conditions are to be faced and he is trying hard to analyze the situation and find the best ways of facing them. This is all evidenced by the number and character of questions coming into this office every day for the Question Box. The indications now are that the discussions brought out by these practical and up to date questions will be very interesting. Applications for membership are being received right along and point to a very large attendance at the Dayton convention. The association idea is very rapidly developing in this State. The Hardware dealer must organize and co-operate to bring about a better condition of affairs.

Joint Committee Represented at the Hardware Conventions.

As chairman of the joint committee of jobbers and retailers on the catalogue house question, S. Norvell of the Norvell-Shapleigh Hardware Company, St. Louis, last week, on invitation, attended the annual convention of the Wisconsin Retail Hardware Association at Milwaukee, where he made an interesting and able address on the work and plans of the committee. This week Mr. Norvell will address the Iowa Association at Des Moines. He has also been invited to address the approaching conventions of the Kentucky, Indiana and Ohio associations.

Ohio Hardware Dealers' Mutual Fire Insurance Company.

Following is the third annual statement of the Ohio Hardware Dealers' Mutual Fire Insurance Company, under date of January 1:

Assets.		
Cash in the Coshocton National Bank..	$2,407.26	
Cash in the People's Banking & Trust Company	12,468.62	
Cash in Second National Bank, Greenville, Ohio	1,000.00	
Cash in office of company	49.83	
Premiums in course of collection on business written subsequent to October 1, 1904	852.00	
Total cash assets		$16,777.71
Office furniture and fixtures		485.07
Liabilities of members to assessment		40,328.52
Total assets		$57,591.30
Liabilities.		
Reinsurance reserve (50 per cent. of premiums on risks in force)	$5,772.64	
All other liabilities	1,000.00	
Total liabilities		$6,772.64
Surplus including members' liability		$50,333.59
Amount of members' liability		40,328.52
Net cash surplus		$10,005.07
Total amount at risk		$858,335.00
Losses paid since organization		3,454.91
Dividends paid to policy holders		3,251.38

The present rate of division to policy holders is 20 per cent.

Geo. M. Gray, Coshocton, secretary-treasurer of the company, writes as follows with reference to the report and the conservative lines on which the business is conducted:

The company, as indicated by the report, is unquestionably saving its policy holders money, and, in addition to this, is laying a foundation for one of the strongest insurance companies in the State.

The attention of Hardwaremen has been directed from time to time, in many ways, to our plan and mode of writing insurance. The rise of the Ohio Hardware Dealers' Mutual Fire Insurance Company, its progress and influence, is due to the united action of its policy holders and to the conservative foundation upon which it is founded. Our company confines its business entirely to Ohio, each risk being well inspected as well as scattered. In addition to Hardware risks we take good dwellings and brick buildings.

ELEVENTH ANNUAL MOTOR BOAT AND SPORTSMEN'S SHOW.

THE eleventh annual National Motor Boat and Sportsmen's Show will be given in the Madison Square Garden, New York, in the two weeks from February 21 to March 9, inclusive, under the auspices of the National Association of Engine and Boat Manufacturers and Sportsmen's Exhibition Company. It will be the most complete exhibition of Motors, Engines and Launches or Auto-Boats the association has shown, and will include Boats of this character from the most moderate in price to the most expensive.

The amphitheater will contain the largest lake yet attempted, which will permit of many boats being exhibited at one time, there being 12 laps to the mile and a minimum width of 26 feet. On the island, which will be reached by means of rustic bridges of ample hight, there will be several exhibits of well-known makes of Boats, and in the center the fly casting contests will be given from an elevated platform. The promenade floor will be entirely occupied all the way around for the first time, the entire east end being occupied by the various prominent Canadian and New Brunswick railroads and New Brunswick Fishery Commission. The west end of this promenade will be similarly occupied by railroads, &c., operating in the Adirondacks and States of Maine and Virginia, with the usual accompaniment of guides, trappers, log houses, &c. On the promenade floor there will be most if not all of the old exhibitors and many new ones. The live animals will be shown in the upper gallery on the Twenty-seventh street side. There will be water sports and various games on the lake, and the management look forward to the most successful exhibit of the entire series.

The Goyer Company, wholesale Hardware, Groceries and Drugs, Greenville, Miss., states that its Hardware department, though only little more than one year in existence, has had a gratifying growth. This department is entirely separate and distinct from the other departments of the business and is operated under a different management. It covers a floor space of 50,000 square feet and includes such lines as Shelf Hardware, Building Material, Stoves, Tinware, Queensware, Wagons and Wagon Material, Buggies, Agricultural Implements, Harness and Leather Goods, Pipe and Pipe Fittings, Roofing, Paints, Oils, &c.

The Smalley Implement Company, Streator, Ill., has succeeded W. H. Smalley, dealer in all kinds of farm Machinery, Vehicles, &c. The company is incorporated for $10,000, and its incorporators are George W. Koontz, Louis Greener, J. F. Hackshaw, R. S. and W. H. Smalley.

Morrow & Tannehill have succeeded Seay, Gill & Morrow Company and Stringfellow & Tannehill at Roswell, N. M., and will continue the general Hardware business in the building formerly occupied by the latter concern. This consolidation of interests will give the new house one of the largest Hardware stocks in the Southwest.

The Eaton Hardware Company, retail Hardware dealer, Brunswick, Maine, was one of the losers in the fire that destroyed the Lincoln block in that city January 18.

THE POPE MFG. COMPANY is planning to transfer its executive offices from New York to Hartford, Conn., where the factories are located. The reason is that it is considered advisable to concentrate the business. The change will be made in about two months.

DEATH OF WILLIAM M. POWELL.

WILLIAM M. POWELL, president and general manager of the Ferrokraft Company, Cleveland, Ohio, died suddenly at his home, on Tuesday, January 31, from apoplexy. He had been in comparatively good health prior to the attack.

Mr. Powell was born in Madrid, N. Y., 53 years ago. He lived at Madrid during his youth and later moved to Brockville, Canada. His father was engaged in the Hardware business, and the son was educated in the same trade. He had won considerable success with its accompanying wealth before he went to Cleveland, about 12 years ago, when he organized and was made president of the Ferrosteel Company. Later he was made manager of the Columbian Hardware Company, where he remained until 1904, when he organized and became president of the Ferrokraft Company, manufacturer of hardware specialties.

Mr. Powell was a member of the Chamber of Commerce, the Union and Euclid clubs, and was well known

WM. M. POWELL.

among the business men of Cleveland. His work with the Chamber of Commerce was such as to attract the attention of the members, and he had held positions on several of the important committees.

Mr. Powell is survived by a widow, a son and a daughter. The interment took place at Madrid on the 3rd inst.

MORLEY BROS.

MORLEY BROS., Saginaw, Mich., have been awarded a gold medal in connection with their fine exhibit of Blue Line Lumbering Tools in the Forestry Building at the late Louisiana Purchase Exposition. The manufacture of these Lumbering Tools was commenced in 1863, and the output has steadily grown until now the plant is one of large magnitude, with plans drawn up for further enlargement. The manufacturers advise us that, beginning with New Orleans in 1884, they have received awards from every large exhibition given in the United States since that time.

GARLAND NUT & RIVET COMPANY.

THE GARLAND NUT & RIVET COMPANY, with offices in the Bailey-Farrell Building, Pittsburgh, and works at West Pittsburgh, has doubled its capacity in the past year in the manufacture of small Rivets and is putting in considerable new equipment to increase its output and permit prompt shipments to customers. The company makes a specialty of Cold Punched Nuts and Semi-finished Nuts, for which it claims perfect accuracy and great uniformity. The company is also a very large manufacturer of Galvanized Pump Chain.

GRAY & DUDLEY HARDWARE COMPANY'S CATALOGUE.

GRAY & DUDLEY HARDWARE COMPANY, Nashville, Tenn., and Birmingham, Ala., has issued a general catalogue containing 1501 pages, substantially bound in cloth and printed on a high grade of paper. The company has spared neither trouble nor expense to make it a complete, convenient and useful book of reference for the Hardware trade of the South. More than 8000 cuts have been used to illustrate the goods manufactured and handled by the company, while its private brands of goods are illustrated in their original colors, much of the color work being the chromatic process. In addition to an alphabetically arranged index of over 18 pages, the catalogue has a department index, as follows:

Mechanics' Tools.
Agricultural Tools and Implements.
Wagon and Buggy Hardware and Wood Work.
Mill Supplies, Iron Pipe Fittings, Steam Goods, Buckeye Pumps, &c.
Builders' and Cabinet Hardware.
Store Fixtures.
Miscellaneous Hardware and Household Goods.
Sewing Machines and Fancy Hardware.
Go-Carts and Baby Carriages.
Iron and Brass Beds.
Trunks.
Clocks and Watches.
Pocket and Table Cutlery, Silver Ware, Cut Glass, Fancy Goods, &c.
Shotguns, Rifles and Ammunition.
Sporting Goods.
Fishing Tackle.
Harness and Saddles.

Illustrations are given of the company's store buildings at Nashville and Birmingham, also of its warehouses in each city, together with its Trunk, Saddle and Harness factories. In addition to two editions for the trade, an edition of loose leaf books bound in heavy leather for the use of its traveling salesmen and house employees at both Nashville and Birmingham has been prepared. The company has also issued seven supplemental catalogues, on thin paper, embracing the lines of goods in the following departments: Mechanics' Tools and Supplies, Cutlery, Silver Ware and Cut Glass, Wagon and Carriage Hardware, Fishing Tackle, Guns and Sporting Goods, Harness, Saddles and Saddlery Hardware. All these catalogues were compiled by the company in its catalogue department, under the supervision of Frank M. Eddington. The printing and binding were also done in Nashville.

FARWELL, OZMUN, KIRK & CO.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn., have placed a contract for the erection of a new nine-story wholesale warehouse. The ground covered is about an acre in area and is situated on the joint tracks of several of the leading railroads of the Northwest. Two spur tracks, side by side, run the entire length of the building, giving them ample car storage capacity. The building is adjacent to the levee, a few feet only from the Mississippi River. The outside construction of the building will be of Kettle River sandstone and vitrified paving brick. This will give the massive, enduring appearance consistent with the class of goods handled by the firm. The entire interior construction, including the columns, will be of reinforced concrete. The offices will be on the fourth floor, approached by a marble staircase from the Jackson street entrance. The first three floors will be used for the shipping room and the storage of heavy goods, and the other floors will be devoted to the firm's extensive line of general Hardware, Cutlery, Sporting Goods, &c. The building will be equipped with high speed elevators, pneumatic tubes and all the facilities necessary for carrying on a large mercantile business in a modern way. The building is to be completed by December 1 next.

North Dakota Retail Hardware Association.

WEDNESDAY, Thursday and Friday, February 1, 2 and 3, were devoted by the retail Hardware merchants of North Dakota to the work of their association and the consideration of trade questions of interest to the membership. The attendance was large and the spirit of the convention practical and enthusiastic. The arrangements made for the comfort and convenience of the delegates reflected great credit on the Entertainment Committee, the representatives of local interests and all charged with special responsibility. The members, too, are entitled to credit for the close attention they gave to the business and deliberations of the convention, which was an unqualified success.

The Distinction of the North Dakota Association.

While the North Dakota Association, from the limitations of the Hardware interests in the State, is not as large in membership as many of its sister organizations, it has the honor of having in its membership a far larger percentage of the merchants within its bounds than has any other association. Its strength financially is also notable, carrying as it does a large fund in its treasury, notwithstanding a liberal and enterprising policy in carrying on its work. This condition is in large measure explained by the character of its membership and the excellent work done by its officers.

The Programme.

An imposing souvenir programme was prepared, containing a great body of advertising from manufacturers and jobbers, with many portraits of persons as principals or salesmen connected with these interests. In this way the association, like other associations, derives a substantian income.

The Sessions of the Convention.

On Wednesday afternoon, February 1, the convention opened in the attractive rooms of the Commercial Club, Fargo, where all the sessions were held. After prayer by Rev. Dr. Dickinson of Fargo the association was welcomed by Mayor A. L. Wull, to whose address H. B. Allen of Jamestown very felicitously responded, saying in part:

H. B. Allen's Address.

It is only fair to the Honorable Mayor that he should know who we are and what we are here for. We are the retail Hardware dealers of North Dakota, and we have no apologies to offer regarding our personality. We believe you will find our convention will not suffer by comparison with other conventions which so often meet in your convention city, whether they are business or professional men or politicians. We are at least very well satisfied with ourselves.

This is largely due to what we have accomplished in the eight years of our existence as an association. One of our objects is the protection of our rights. We are what are called middlemen, and we have to watch both fore and aft. It is of vital importance that the retail dealer buys his goods right, and we have learned by experience that a wholesaler can hear far better and sooner when spoken to through the association than by one retailer who stands alone, thus proving true the old adage that "In union there is strength."

Another object is education; for no one can rub shoulders with the Hardwaremen of North Dakota without learning something which he can turn to his advantage. Another fruitful source of information is the addresses of the representatives of the wholesale houses. While our interests are not identical in every particular, yet we have a common foe and we have joined our forces to resist his encroachments on our prosperity. We do not flatter ourselves that the catalogue houses of the large cities are a thing of the past, but their encroachment on the legitimate Hardware business is handicapped by the united efforts of wholesaler and retailer.

Another source of pleasure and profit to the members of the association is the privilege of meeting and greeting the knights of the grip. I fear we do not appreciate the labors of these faithful friends. We owe much of our prosperity to them. Their visits to our places of business are a source of inspiration as well as information, and let us not forget to give them the glad right hand of welcome and as large an order as our business will justify.

The remainder of this session was tendered to the traveling men for an interesting general discussion, under the leadership of Frank M. Wolfe of Fargo.

Sessions were also held morning and afternoon of Thursday and Friday. The substance of several of the papers and addresses are given in the following columns. The second day's meetings were open to all and largely attended. The meetings on Friday were limited to members. A memorable courtesy was extended to R. R. Williams, Hardware editor of *The Iron Age*, in his election as a life member of the association.

Selling Stocks of Goods in Bulk without Notice to Creditors.

There was quite a discussion pertaining to laws beneficial to the association, and the organization went on record as favoring the enactment of a law forbidding the sale of stocks of goods in bulk without giving notice to creditors. A Legislative Committee was appointed and instructed to prepare a bill covering the essential points of such a law and endeavor to secure its passage at the present session of the Legislature. The law which seemed to be the most desirable was the one now in force in the State of Connecticut.

Tribute to Secretary Barnes.

A very pleasant feature of the gathering was the presentation to C. N. Barnes of an elegant gold watch

H. F. EMERY, President.

chain and Masonic charm—the charm is in three sections and contains the emblems of the York and Scottish Rite bodies in Masonry—with the inscription on the inside, "North Dakota Hardware Association to C. N. Barnes, February 3, 1905." The presentation was happily made by a chosen committee, consisting of Messrs. Harrington, Jacobson and McIntosh, the latter acting as spokesman. Subsequently R. R. Williams, speaking on behalf of the association, presented Mr. Barnes with some cut glass table ware with the request that he convey it to Mrs. Barnes with the compliments of the members. All this was a complete surprise to Mr. Barnes. It was a fitting recognition of the appreciation of his splendid work as secretary and the affection and honor in which he is held.

National Association.

Mr. Pinkerton of Lakota read a communication from M. L. Corey, secretary of the National Association, in which a very concise report of the association's work, accomplished and contemplated, was given.

Election of Officers.

The new officers of the association are as follows:

PRESIDENT, H. F. Emery, Fargo.
FIRST VICE-PRESIDENT, Martin Jacobson, Minot.
SECOND VICE-PRESIDENT, H. H. Walther, Casselton.

THIRD VICE-PRESILENT, O. I. Butler.
SECRETARY, C. N. Barnes, Grand Forks.
TREASURER, H. T. Helgesen, Milton.
EXECUTIVE COMMITTEE: W. R. McIntosh, E. E. Elliott and W. H. Pinkerton.

The delegates to the National Convention are as follows: H. T. Emery, C. N. Barnes and G. W. Wolbert.

Resolutions.

The following resolutions were adopted:

Resolved, That we, the members of the North Dakota Retail Hardware Association, do return thanks to the Author of our mercies and the Giver of all good for the privilege of meeting and greeting our friends here and for the prosperity that has attended our labors during the past year.

Resolved, That we extend to the Hardware trade papers and their representatives our appreciation of the very liberal and able manner in which they have always championed our cause and wish them to realize that we appreciate their efforts.

Resolved, That we express our appreciation of the very interesting and instructive address of Prof. H. A. Sheldon and heartily recommend his School of Scientific Salesmanship to all young business men; also of the addresses of the representatives of the jobbers of the Twin Cities and Duluth.

Resolved, That we again reaffirm our appreciation of the able and successful efforts of our respected secretary,

C. N. BARNES, Secretary.

who is untiring in his efforts to advance the interests of the association.

Resolved, That we extend to the wholesale and retail Implement and Hardware dealers of Fargo our sincere thanks for the royal entertainment given the Implement and Hardware men at Piries Hall on February 2.

Resolved, That it has given us great pleasure to welcome to our convention the editor of *The Iron Age*, the greatest Hardware journal in the world, R. R. Williams. We are proud of his presence at our meeting and bid him Godspeed in his great and glorious work.

Resolved, That we are, individually and as a State organization, opposed to any Parcels Post bill now before Congress, and particularly H. R. 17,116, introduced by Representative Cowherd of Missouri. These bills are all detrimental to the interests of the retail merchants in all small towns of the United States. They also mean more expense to the United States Government Postal Service, which at present shows a deficit each year. Such bills mean, in plain words, that the Government is willing to aid the wealthy to gain more wealth, at the expense of the small retailer and the people. It is now becoming more a matter of thought of how best to develop small communities into prosperous towns, not how to concentrate more wealth into large towns. We therefore earnestly request that you use all your best efforts to prevent the passage of any such law. This resolution is to be sent to each Senator and Congressman of our State.

Resolved, That we request jobbers not to ship goods to consumers on our account, except with tags which show for whose account these goods are shipped, so as to prevent dealers believing that jobbers are unfair to our members.

Resolved, That the retail Hardware dealers, in convention assembled, favor the enactment of laws prohibiting the sale or transfer of stocks of goods or merchandise in bulk without first giving due notice to their creditors.

The Banquet.

A banquet was given on Thursday evening to about 500 delegates and visitors in attendance at the convention of the Hardware merchants and Implement dealers. It was tendered by the wholesale and retail Hardware and Implement dealers of Fargo and was an occasion which made an exceedingly pleasant impression as an evidence of hospitality and fraternity and on account of the high quality of the entertainment. After dinner, Hon. Joseph Hare acting as toastmaster, addresses were made by A. F. Sheldon, R. R. Williams, W. W. Collier, H. T. Helgeson and others, after which W. I. Nolan entertained the company most admirably.

Entertainment Committee.

The Entertainment Committee, consisting of Geo. Hall, Hall-Robertson Hardware Company, representing the Hardware jobbers; L. W. Miller, Northwestern Thresher Company, representing the Implement men, and M. R. O'Neill, representing the retail Hardware merchants, performed their duties most admirably, doing everything that could be done to make the convention successful and to emphasize the hospitality and public spirit of Fargo.

Next Meeting.

By a unanimous vote Grand Forks was chosen as the meeting place of the association for 1906.

Exhibits.

A feature of the convention was the large number of manufacturers and jobbers who, by their principals or salesmen, were in attendance at the gathering. Many of them had exhibits of the goods or specialties in which they are interested, and many souvenirs were distributed.

Convention Notes.

Prominent among the visitors were R. A. Kirk of Farwell, Ozmun, Kirk & Co.; T. G. Walther of Hackett-Walther-Gates Hardware Company; B. W. How of Kelley-How-Thomson Company; P. W. Lyon and F. J. Hopkins of Janney, Semple, Hill & Co., and H. D. Final of Marshall-Wells Hardware Company.

The address by A. F. Sheldon, president of the Sheldon School of Scientific Salesmanship, was impressive and instructive and much enjoyed by the large audience that listened to it.

Little use was made of the Question Box, the fact being that with the full and attractive programme and the interest of the discussions there was little opportunity for it.

Annual Report of the President.

BY H. F. EMERY, FARGO, N. D.

One month of 1905 has passed and already we are familiar with the new year; 1904, with its hopes and fears, its opportunities and its results, has been laid away forever.

We are living in a swift and changing age. Our nation is growing very fast in wealth, and the age seems to have been reached where Napoleon and George Washington both saw through their eye of faith the greatest nation on earth.

As we note the great progress that is being made we, as Hardware merchants, ask, What has our association accomplished? and we answer, It has accomplished wonders.

Compare the business done by catalogue houses in 1896 with 1904, and we must admit they have not kept pace with the growth of the country. That the merchants are guarding closer every year from buying of those who by their actions are against us is evident from the way they are getting into line.

COMPLAINTS.

Some complaints have been made, and justly too, where jobbers have been overanxious to sell goods and have sold general stores a complete stock of Hardware. Such cases are to be deplored, but we are glad to state they

are the exception to the rule, as but two such transactions were reported in 1904 for North Dakota.

A few cases have been reported where jobbers have stepped over and gone outside, but in most cases there is a good reason or a misguided traveling agent that accounts for the transaction.

The whole year's record points to the belief that the jobbers as a whole are anxious to keep their lines in the regular channel of trade. It is not my purpose to name any particular house, but there are some who have caused more complaint than others, which would lead us to believe that they did not have quite the same interest in us or that their system of doing business was more lax.

The report of the National Convention will be read at this session, and will show what they are doing for us. The past year's work of the National Association has demonstrated that it is through it that the great results are being brought forth, and it behooves us as dealers to be loyal to our association and to try our best to induce those who are not already members to become such.

In conclusion I would call your attention to Hardware mutual insurance companies. Through them has the door been opened whereby an entering wedge has been driven that will eventually reduce our rates in the West as they have been in the East, and I recommend to you the Minnesota company, which has reached that point in magnitude where there is no doubt of its ability to withstand the storms.

Secretary's Report.

BY C. N. BARNES, GRAND FORKS, N. D.

In preparing my report to read to you each year I find that the matter available for me to make such a report from is so similar to that of the preceding years that it makes me feel that the essential feature to make it interesting is lacking. This report, which is the eighth that I have been privileged to submit to you, will be made as brief as possible, and will contain merely a rough sketch of the work taken up by me during the past year, with possibly a few suggestions of matters that it may be advisable to consider while we are together.

ADJUSTING GRIEVANCES.

From my point of view the past year has been a particularly satisfactory one in the adjustment of grievances. Our membership having increased each year has necessarily brought us in touch with more people, and the result has been that we have had more grievances reported by members during the past year than in any preceding one, and in the large majority of cases they have been satisfactorily adjusted, and in most instances without any difficulty; but several cases have required various trips of your officers for consultation.

MEMBERSHIP.

One of the essentials necessary for making any organization of business men a success is to have its membership as large as possible and of good loyal dealers. This is the principle on which we have been working ever since our organization was perfected, in September, 1897. Thinking that it might be of interest to you to know the character of our growth since that time, I submit the following comparative table, which will give you our membership, also the number of Hardware dealers engaged in business in the State on the different dates of our annual meetings:

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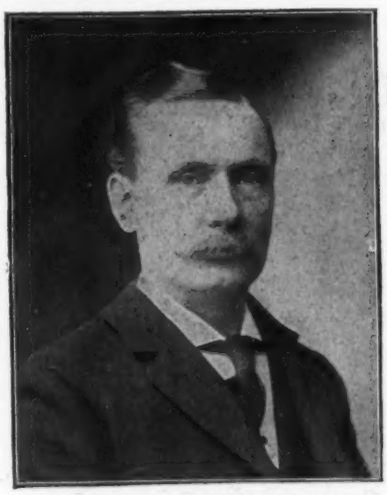
Mr. Barnes then presented another comparative list showing North Dakota divided into counties and the Hardware dealers located in these counties, with the membership in the association.

Continuing, he said: You will notice from this table that there are seven counties in the State without Hardware dealers, and that we have members in every county in the State where there are dealers with the exception of two. In these two counties there are but two dealers and in the other one. While our membership is small in numbers as compared with other Hardware associations in the more populated States I believe we have much to be thankful for when we are able to show the membership we have in good standing out of the available dealers we have to draw from.

CORRESPONDENCE.

The correspondence feature of association work has generally been alluded to when submitting reports and in making mention of it in this one will say that the past year shows that particular feature of our work the largest of any in the history of our association. I will not attempt to submit any figures to you in connection with the mail matter handled, but to give you a rough idea of its magnitude will say that the money we have spent in postage considerably exceeds the $100 mark. I have felt that the free use of the mails was the best means available for us to keep in touch with our members and also for securing new members, so I have never hesitated in any instance to make all the use I could of this avenue.



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NATIONAL ASSOCIATIONS.

In all probability there is no one in attendance at this meeting who is not familiar with the good work that has been accomplished the past year by committees from the National associations of the jobbers and retailers of Hardware in causing the withdrawal of many standard lines of goods from catalogue houses. This accomplishment alone is worth many times more to you than the dues in this association for ten years would amount to; and this would have been impossible if it had not been for the thorough organization of both the retailers and jobbers in their respective associations. While we are in session I believe it is our duty to prepare appropriate resolutions showing our appreciation of the good work done by these committees.

There is another duty we owe, and that is our loyalty to the manufacturers who are making this fight effective. We should familiarize ourselves with their goods and be particular to see that they are specified when buying, as there would be but little incentive on their part in continuing to aid us in the way they are if we did not reciprocate when an opportunity presents itself.

LEGISLATIVE WORK.

Of late there has been some legislative work suggested to me by our members that it may be well for us to consider while together and have referred to proper com-

mittees. One of our members thinks we should be privileged to file liens on Threshing Machinery for supplies furnished and another does not want the present mechanics' lien law changed, as is now being agitated. Another wants a law enacted preventing the sale of stocks of merchandise in bulk. To me one of the worst laws we have to contend with is the present bankruptcy law and I believe it is not approved by the average merchant, and if such should be the sense of the meeting would it not be desirable to notify our representatives at Washington of our disapproval of this law by fitting resolutions and ask for at least a revision of it?

MUTUAL FIRE INSURANCE.

I am pleased to report that the mutual fire insurance that is being offered to us by our sister associations has been taken to very generally by our members, and a large portion of them are carrying some of the insurance with either the Minnesota or the National company, both of which, I believe, are considered equally reliable and offer the best of protection and at considerable less expense to the policy holder than the established board rates of the old line companies.

During the past year several of our members have suffered fire losses where portions of their insurance were carried with the Minnesota company, and I believe in each instance the adjustment was made promptly and satisfactorily. I should like to see more of our members carry some of this insurance, and feel that those of you who are not carrying any of it, if you would only investigate, would not hesitate to at least divide up your insurance with the mutual companies.

Credits.

BY F. J. HOPKINS, JANNEY, SEMPLE, HILL & CO., MINNEAPOLIS, MINN.

What is credit? Of what is it composed? Why so valued? As applied to your business and ours it means the power we possess to obtain the property of another without immediate payment therefor. It is composed of many qualifications, some of which are capital, integrity, ability, habits, and, in this age, the power to hustle and succeed. Why is it so valued? For the reason that modern methods make the possession of it a necessity to enable one to do business. More than 98 per cent. of our sales are on credit, and a full 100 per cent. of our purchases.

I wish I could tell you how to make only good credits. It would be worth some little to me if I knew. I can simply say, "Do your best," as we all have to, keeping in mind a few fixed principles. Your credits and ours are quite different, and the same rules would scarcely apply. There are some, however, that do, and I would call attention to such as honesty, ability and not being afraid to work. These should recommend to you every man applying for credit. I would also call attention to such as intemperance, laziness, lack of any capital and the man who always owes too much. These should be shunned.

An account rightly opened on the proper basis makes easy its collection. I would suggest in all cases where you open a new account or after balancing an old one, if it is again reopened, that you would try to impress upon your customer that you have in mind the pay day. When he begins his purchases say to him, "John, I am willing to give you credit and to accommodate you, but I wish to know at what time you expect to pay your account. I have my bills to meet and must figure accordingly." Get fixed in his mind a time when you expect him to pay, and, if the conditions are right, present your account at that time to let him know you remember the transaction, and it will aid you more than you think in getting your money.

Credits and collections are as close relations as the Siamese twins; the one determines the value of the other; and, in speaking of credits, one cannot ignore the twin brother.

A WINNING COMBINATION.

From years of comparison and experience covering the same field of operations I have found one combination that seldom, if ever, fails to win in business. It may be possessed by an individual, but more often by two men. It is the power to be a good salesman and also possessing the ability to be a good collector, and not only having the ability, but making use of it. This combination very often begins business with a limited capital, but in a few years it enters the list of discounters and its progress is rapid.

CREDITS FROM THE WHOLESALE STANDPOINT.

I have endeavored up to this time to occupy a place behind your office desk and to briefly outline some suggestions that I feel will aid you in extending credit and making your collections; but you would think I had missed my opportunity at least did I not say something of credits from the wholesale standpoint. For many years the manufacturer and jobber have depended largely, and been greatly aided, in extending credit from the information furnished by the two leading mercantile agencies, Dun and Bradstreet, until they are now recognized throughout the land as the natural source for the distribution of credit information, useful alike to the jobber and retailer, and it is unfortunate that in giving your credits you cannot rely on some agency of this character to ask your customer what you sometimes think personal questions. We have also in our house for some years made it a practice of obtaining from customers at a time when invoicing is general and the inconvenience least a statement showing the condition of their business. This we believe to be the best and most authentic information possible to obtain, and I desire to ask your hearty co-operation along this line. It must first be understood that the entire transaction is of a confidential nature, and the information is obtained only for our use and mutual good. The principle involved is right, because it is fair and just, that if we trust you with our money we should be allowed to at least form an opinion as to your ability to repay. Guessing is eliminated; and at this point I wish to say that your interest and your jobber's are identical. He is almost as anxious to see you succeed as you are to do so; and if in these yearly exhibits which are examined with much interest the seeds of danger are discovered—such as overcredit or poor collecting, evidenced by heavy outstandings; overbuying as seen in unusually large stocks, heavy and out of proportion indebtedness, extensive land holdings, first payments of which have often been taken from the capital of the business, and light insurance—these are, with a deep interest your jobber has in your welfare, taken up and suggestions offered for the betterment of your business. Could you know how often some one of the above weaknesses appear in statements you would be surprised. Especially is this true of insurance. If you cannot afford to charge your expense account each year with an amount adequate to pay for proper protection against loss by fire you cannot afford to continue in the business.

I would also call attention to the fact that we find many customers who do not take a yearly inventory of their stock. This indicates very lax methods or disinterest in your business. There are two very important reasons why you should take an inventory each year: First, to know the price of your labor and energy for the 12 months through which you have operated, and, secondly, to have a proper basis for the adjustment of your insurance in case you are unfortunate enough to be visited by fire.

If for any reason you object to giving personal statements to your jobber, I would urge upon you the filing each year with Dun and Bradstreet of such a showing. It has become an up to date business custom. It gives you the commercial rating to which you are entitled and, unless your business is in a very poor condition, will work to your good, if only to relieve you of unnecessary correspondence. Before dropping this subject I wish to say that while we discount every purchase made, we are not too good or too large to each year give both the agencies our financial statements.

SCATTERING PURCHASES.

Another weakness we sometimes note, especially with merchants of limited capital, is the tendency to scatter their purchases. This, in my opinion, is not to your advantage, for the reason that no house places great value on a trade where it is receiving only a small part of

are the exception to the rule, as but two such transactions were reported in 1904 for North Dakota.

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H. T. HELGESEN, Treasurer.

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LEGISLATIVE WORK.

Of late there has been some legislative work suggested to me by our members that it may be well for us to consider while together and have referred to proper com-

mittees. One of our members thinks we should be privileged to file liens on Threshing Machinery for supplies furnished and another does not want the present mechanics' lien law changed, as is now being agitated. Another wants a law enacted preventing the sale of stocks of merchandise in bulk. To me one of the worst laws we have to contend with is the present bankruptcy law and I believe it is not approved by the average merchant, and if such should be the sense of the meeting would it not be desirable to notify our representatives at Washington of our disapproval of this law by fitting resolutions and ask for at least a revision of it?

MUTUAL FIRE INSURANCE.

I am pleased to report that the mutual fire insurance that is being offered to us by our sister associations has been taken to very generally by our members, and a large portion of them are carrying some of the insurance with either the Minnesota or the National company, both of which, I believe, are considered equally reliable and offer the best of protection and at considerable less expense to the policy holder than the established board rates of the old line companies.

During the past year several of our members have suffered fire losses where portions of their insurance were carried with the Minnesota company, and I believe in each instance the adjustment was made promptly and satisfactorily. I should like to see more of our members carry some of this insurance, and feel that those of you who are not carrying any of it, if you would only investigate, would not hesitate to at least divide up your insurance with the mutual companies.

Credits.

BY F. J. HOPKINS, JANNEY, SEMPLE, HILL & CO., MINNEAPOLIS, MINN.

What is credit? Of what is it composed? Why so valued? As applied to your business and ours it means the power we possess to obtain the property of another without immediate payment therefor. It is composed of many qualifications, some of which are capital, integrity, ability, habits, and, in this age, the power to hustle and succeed. Why is it so valued? For the reason that modern methods make the possession of it a necessity to enable one to do business. More than 98 per cent. of our sales are on credit, and a full 100 per cent. of our purchases.

I wish I could tell you how to make only good credits. It would be worth some little to me if I knew. I can simply say, "Do your best," as we all have to, keeping in mind a few fixed principles. Your credits and ours are quite different, and the same rules would scarcely apply. There are some, however, that do, and I would call attention to such as honesty, ability and not being afraid to work. These should recommend to you every man applying for credit. I would also call attention to such as intemperance, laziness, lack of any capital and the man who always owes too much. These should be shunned.

An account rightly opened on the proper basis makes easy its collection. I would suggest in all cases where you open a new account or after balancing an old one, if it is again reopened, that you would try to impress upon your customer that you have in mind the pay day. When he begins his purchases say to him, "John, I am willing to give you credit and to accommodate you, but I wish to know at what time you expect to pay your account. I have my bills to meet and must figure accordingly." Get fixed in his mind a time when you expect him to pay, and, if the conditions are right, present your account at that time to let him know you remember the transaction, and it will aid you more than you think in getting your money.

Credits and collections are as close relations as the Siamese twins; the one determines the value of the other; and, in speaking of credits, one cannot ignore the twin brother.

A WINNING COMBINATION.

From years of comparison and experience covering the same field of operations I have found one combination that seldom, if ever, fails to win in business. It may be possessed by an individual, but more often by two men. It is the power to be a good salesman and also possessing the ability to be a good collector, and not only having the ability, but making use of it. This combination very often begins business with a limited capital, but in a few years it enters the list of discounters and its progress is rapid.

CREDITS FROM THE WHOLESALE STANDPOINT.

I have endeavored up to this time to occupy a place behind your office desk and to briefly outline some suggestions that I feel will aid you in extending credit and making your collections; but you would think I had missed my opportunity at least did I not say something of credits from the wholesale standpoint. For many years the manufacturer and jobber have depended largely, and been greatly aided, in extending credit from the information furnished by the two leading mercantile agencies, Dun and Bradstreet, until they are now recognized throughout the land as the natural source for the distribution of credit information, useful alike to the jobber and retailer, and it is unfortunate that in giving your credits you cannot rely on some agency of this character to ask your customer what you sometimes think personal questions. We have also in our house for some years made it a practice of obtaining from customers at a time when invoicing is general and the inconvenience least a statement showing the condition of their business. This we believe to be the best and most authentic information possible to obtain, and I desire to ask your hearty co-operation along this line. It must first be understood that the entire transaction is of a confidential nature, and the information is obtained only for our use and mutual good. The principle involved is right, because it is fair and just, that if we trust you with our money we should be allowed to at least form an opinion as to your ability to repay. Guessing is eliminated; and at this point I wish to say that your interest and your jobber's are identical. He is almost as anxious to see you succeed as you are to do so; and if in these yearly exhibits which are examined with much interest the seeds of danger are discovered—such as overcredit or poor collecting, evidenced by heavy outstandings; overbuying as seen in unusually large stocks, heavy and out of proportion indebtedness, extensive land holdings, first payments of which have often been taken from the capital of the business, and light insurance—these are, with a deep interest your jobber has in your welfare, taken up and suggestions offered for the betterment of your business. Could you know how often some one of the above weaknesses appear in statements you would be surprised. Especially is this true of insurance. If you cannot afford to charge your expense account each year with an amount adequate to pay for proper protection against loss by fire you cannot afford to continue in the business.

I would also call attention to the fact that we find many customers who do not take a yearly inventory of their stock. This indicates very lax methods or disinterest in your business. There are two very important reasons why you should take an inventory each year: First, to know the price of your labor and energy for the 12 months through which you have operated, and, secondly, to have a proper basis for the adjustment of your insurance in case you are unfortunate enough to be visited by fire.

If for any reason you object to giving personal statements to your jobber, I would urge upon you the filing each year with Dun and Bradstreet of such a showing. It has become an up to date business custom. It gives you the commercial rating to which you are entitled and, unless your business is in a very poor condition, will work to your good, if only to relieve you of unnecessary correspondence. Before dropping this subject I wish to say that while we discount every purchase made, we are not too good or too large to each year give both the agencies our financial statements.

SCATTERING PURCHASES.

Another weakness we sometimes note, especially with merchants of limited capital, is the tendency to scatter their purchases. This, in my opinion, is not to your advantage, for the reason that no house places great value on a trade where it is receiving only a small part of

it and possibly obliged to carry some of that. You can, in my opinion, obtain as good price results from two houses in a line as more, and if with your trade thus distributed at any time you need accommodation, your business being a liberal one and only a few interested, you will find no difficulty in obtaining what you require.

EXCHANGE ON PERSONAL CHECKS.

I believe that the gentlemen composing this organization are disposed to be broad gauged, fair minded and to concede the jobber his own; that it would be gratifying to you to relieve the wholesaler and manufacturer of any unnecessary burden, and that there is not one of you but would scorn to pay his just debts at less than 100 cents on the dollar, and in this connection I cannot resume my seat without calling attention to an expense item on our books, representing last year about $2000, that is unbusinesslike and unjust. It is the exchange we are obliged to pay your bank for the pleasure of obtaining your money on your personal checks. It is the hold-up of the country bank on the city jobber and manufacturer, and I believe each year this practice costs these interests of the Twin Cities $100,000, if not much more, and we seem powerless to remedy it without your help; but if you desire to aid us you can very materially reduce this expense item, and I would suggest the remedy as follows: In paying for your purchases either obtain from your bank a draft covering the amount required, which, in my opinion, can be procured by you without one cent of cost, as your banker will treat you differently from what he will us, in whom he has no interest; or, if this cannot be done, you can open an account with any of our city banks and make your payments, drawing your personal checks on an account where the funds are passed at par; or you can draw your own personal check on your home bank, learning from your banker where he keeps his Twin City or Chicago account, and using a rubber stamp stating that this check will be paid without exchange through such and such a bank. This cannot but appeal to you as fair and right, and we believe that there are many gentlemen in this association that do not know that on every check they send in there is a slight discount deducted therefrom before we can obtain your money.

The Evolution of the Stove Business.

BY G. L. NYE, MINNESOTA STOVE COMPANY, SHAKOPEE, MINN.

Evolution of the Stove business may include a history of the industry, its growth, and its constant westward trend since Stove making began in the United States. It is not my intention to go into that feature of the business to any extent. Evolution of selling methods and methods of distribution interest the retail Hardwareman more. In the memory of all of us we have seen many changes in this particular. Right now we are confronted with two important problems. What will be the effect of catalogue house competition on the retail Hardwareman's Stove business in the near future? Where is the jobber, with his peculiar methods of Stove selling, taking us?

MAIL ORDER STOVE BUSINESS HAS ITS LIMITATIONS.

I once thought the mail order business in Stoves would grow to menacing proportions. I have changed my mind on that score to a certain extent. I still think there will be some growth in that direction, but I believe it has its limitations. Tremendous efforts are being made by advertising agencies to get Stove manufacturers to embark in the mail order trade, and I assure you that it is not without some attractions. One of the advertisements from one of these agencies came to me a few days since, and while it was intended to stimulate the thought of mail order business, it had the contrary effect. It read:

> Tell your story where it will be heard. Don't try to sell mail order goods to people who get into a big city department store every day. Get out into the country; country people have plenty of time to read papers. Country folks have just as many wants as city folks. Everything they buy, except the bare necessities of life, must come by mail from some mail order house.

As I said, this advertisement had the opposite effect on me than the one intended. In the first place the country folks are not the large consumers of Stoves. I think you will all agree with me that your sales are larger in your towns than in the country; I mean in proportion to the population. So there is still a field for profitable Stove business.

The fact that the farmer is reading will add very materially to the downfall of the mail order Stove man. Neither does he buy all but the necessities of life by mail. You will continue to see him in your towns, as his social side must be developed, and when you see him talk to him, asking him if he liked his mail order Stove. He will eventually tell you the truth and come to see you the next time he wants a Stove.

ONLY A SMALL PERCENTAGE OF STOVES SOLD BY MAIL ORDER.

Another fact we must keep in mind is that although the mail order man has been making a lot of noise he has not distributed anywhere near the percentage of the total output of Stoves that many people think he has. In fact, up to the present time but a very small percentage has been distributed by the mail order method. This is the result after years of pounding by numerous mail order concerns, some of them ranking among the largest retail institutions of the country. It seems to me that the mail order Stove business has about reached its limit.

THE JOBBER OF STOVES A MORE DANGEROUS FACTOR.

There is, however, what I consider a more dangerous factor recently come into the distribution of Stoves, and that is the Hardware jobber. This jobber reaches farther than the mail order man. He goes to all the country stores, or so-called general stores, not only in small villages, but to the crossroads, where there is nothing but one small store. So far as the Stove trade is concerned I think this competition far more demoralizing and a much greater profit destroyer than the mail order man.

If a customer comes to you and says he can buy a Stove for a certain price from a mail order house, you know just what argument to use with him, and just what you have to contend with; while, on the other hand, if he says that Jones at the crossroads 3 miles out will sell him a Stove for so much you do not know where you are at. You do know, however, that Jones will sell this Stove at a much less profit than you will or can, so you have to let him sell it and fatten the jobber. Jones doesn't need any fat, and wouldn't know what to do with it if he had it. This jobber is bending every effort to get an outlet for his goods by the above methods, and by doing all he can to encourage new stocks in the already overstocked towns. I have an advertisement, cut from one of the leading trade papers last summer, which will bear me out in this. In it a leading Hardware jobbing house gives a list of towns where it believes Hardware retailers can profitably locate. Of this list of about 30 towns 6 have 15 to 80 population, 15 have from 100 to 300 population. All of these towns have from one to two Hardware stocks now. The balance of the list ranges from 300 to about 3000 population. From the testimony of mercantile reports these are already overstocked from a retail Hardware standpoint.

I think you can all see plainly that the jobber in the Stove business is more to be feared as a demoralizer than the mail order men. The jobber will continue to grow as the wants of the country grow, but your Stove business will not continue to grow in proportion, although the aggregate of the Stove business is larger every year. The evolution of the business is in the methods of distribution.

I do not see any reason why the West should not be producing a large percentage of its own consumption of Stoves within comparatively few years. I believe the industry has a big future in the West. I believe that Western retailers and Western users of Stoves will have a preference for Western made Stoves. I hope that this big increase in output will be marketed through the Hardware stores and that influences which tend to cut up the Stove business until it means very little to the Hardware retailer can be counteracted.

Wealth in Many.

BY M. G. EVENSON, COOPERSTOWN, N. D.

That which represents the mercantile or commercial system of our land was for years divided into three

classes—first, the manufacturer; second, the jobber, and last, the retailer. That this system may still be maintained is our wish, as it represents the sole source of revenue and wealth of most of us. It surely would not be worth our while to examine at great length the errors of this system, which has stood so long, and must continue in order to support the outlying country, that it may not cease to prosper as it has in the past. The industry and commerce of a great country have always been regulated by the departments of the Government. The Hardware business of to-day must be regulated by a State association, which is affiliated with a national association, whose duty it shall be to ask a liberal plan of justice upon our branch of mercantile life, and see that no extraordinary privileges are given that will be detrimental to the outlying country.

THE CATALOGUE HOUSE SYSTEM.

Experience teaches us that the new system of mercantile life, or, as now called, the catalogue house, is causing the means of support of the Hardware merchant to be cut down too much. The capital error of this new system lies in the special privileges given. The following observations may serve to show the impropriety of this new system as it is now carried on:

This new system is acknowledged to be the distributer of only a small portion of the goods used in the country, and that part so distributed is for cash in advance, and by means of a catalogue in which are quoted prices on standard goods, which the merchant in the country cannot duplicate with any profit to himself on a credit and cash basis. No doubt the manufacturer appreciates the cash business of the catalogue house, and, I believe without a thorough study of future results, has given special privileges which he should not have given.

Surely, if all cash goes to the city and all credit to the country, the country being the larger, the credit will soon become too great for them to bear, and the new system having no credit to offer, what can our country do, as credit we must have as well as cash, in order to enable the country to grow and prosper and increase the demand for the manufacturer's goods?

NECESSITY OF THE COUNTRY MERCHANT.

The country contributes to the annual profit of the manufacturer by the credit and cash system, which is much the larger and has the maintenance of the country at large during the greater part of the year. Unless the country merchant is given some hearing, so that the credit part of his mercantile life is regularly cared for by a reasonable profit, the merchant cannot prosper, and unless he does prosper he must look to other sources to make a living. When he does, what will the manufacturer do with his goods that have always found an outlet through the cash and credit system of the jobber and merchant? Let our army of merchants desert the country, and that which has enabled our country to prosper is taken away, as the catalogue house cannot get in close enough touch to enable it to do a credit business.

THE COUNTRY PURCHASING POWER.

The purchasing power of the country being much the larger, the manufacturer ought to look upon that outlet for his goods as a fund upon which he can draw, and if he injures that fund by giving special privileges on standard goods to catalogue houses, which enable them to get out of the place in which they belong—namely, third place—he surely is reducing the outlet for the largest part of his goods.

In the past most manufacturers seem not to have considered that the multitude of merchants, by the natural effort which every man has, are continually making a better outlet for their goods, and the special privilege will soon cause the efforts of the merchant to be put upon some line of goods that the catalogue house cannot print cut prices on and send broadcast. It seems therefore altogether improper to consider the catalogue houses anything other than they are—namely, retail merchants.

I have classed the jobber, merchant and retail catalogue house as a fund upon which the manufacturer draws. Now let me add one of the strongest maintenance fund producers, that branch known as

THE TRAVELING SALESMAN.

A traveling salesman has a greater value as an outlet than a catalogue sent through the mail. To say he has not would be to say that a deaf and dumb man could get as good results on the road as a live, up to date traveling salesman. The drummer, in mingling with his customers and buyers in general, keeps in close touch with them. Therefore it reasons out, to one who stops and considers, that through this being in mutual touch with the trade better results can be obtained for a manufacturer's goods than special privileges given as to the catalogue house.

It is upon this reasoning that I say there is "wealth in many." What manufacturer would not rather have this army of salesmen covering the country to help him get his goods before the people than catalogue houses located in some city, with but reduced prices on well-known brands of goods, and their limited circulation of this silent salesman as their only means of securing for them the business of the outside world?

It can never be to the interest of the manufacturer to discourage in any respect the industry of the many. The greater the attention given the channel through which a manufacturer's goods flow, the greater will be his fund to draw upon. The establishment of perfect justice and of perfect equality is the very simple secret which most effectually secures the highest degree of prosperity to all. Therefore it is this building up policy we all want, that the country may grow and prosper. Let us then work intelligently and patiently, singly and jointly, that we may all agree and accomplish much.

Catalogue House Competition.

BY R. L. SCOTT, JAMESTOWN, N. D.

In my judgment the catalogue houses have declared war on the legitimate retail dealers and are pouring shot and shell into us from every side. They have already sentinels stationed at every point where there is business. These sentinels and carriers are paid by Uncle Sam. The catalogues are their munitions of war and are at work seven days in the week, beginning Sunday morning and working continuously until the following Saturday night, every day and every night, 365 days in the year, year in and year out, while the retail merchant goes to his store at 8 o'clock, looks over his mail, and watches around to see how business is going and hears his clerks tell of a few sales they have lost from catalogue house competition. He goes to dinner at 12 o'clock, back at 1.30, goes to the bank and looks up a few delinquents, tells his clerks to keep their eyes on the gun and goes home at 5 or 6 o'clock, having worked about 8 hours, while our competitors, the catalogue houses, put in 16 or more, every minute of which is used in one direction, advertising good goods and cheap goods, the very thing to induce people to trade with them, while the retail merchant gives about one-sixteenth of his time to trade getting.

SHOULD STAND TOGETHER.

I think we retail merchants should march out and line up as in battle. We should stand together as a unit. We should say to the jobber: "If you want our business stop furnishing ammunition to our enemies and supply us with such goods as we need to fight competition," pledging ourselves at the same time individually to the jobber that we will use such goods for that purpose only, and then advertise these goods along with other things, the same as the catalogue houses do. They offer a few items at cost and catch the trade. We should do the same, and as the catalogue competition gets stronger the closer we must deal. Stop saying yes to those that want credit and tell them why—that you can't meet catalogue house competition and sell on credit. Find out who among your customers buy from catalogue houses, make a list of them, and you will be ready for them when they want credit.

THE RETAILER'S OPPORTUNITY.

Some of these people are buying from their home merchants on time and sending their money away. You can stop your part of that if you know who they are. Let them know that the fight is on and that you are in the battle to win. Meet any catalogue price (quality con-

sidered). I regard home competition one of the greatest drawbacks in contending with the catalogue competition. I am afraid to make a fight on catalogue houses for fear my home competitor will reduce the prices on Nails, an item we do not need to cut the prices on. If I say to a man, "I can't credit you, because you send your money away to catalogue houses," that man will go to my competitor and get credit. If my customer sends to a catalogue house and buys all his Builders' Hardware for a building and then comes to me for Nails I would like to charge him a profit, but my competitor sells him Nails at cost in order to get him for a customer. If every retailer would join his retail dealers' association and attend the annual meetings and get in line, read the Hardware journals, get in step and fire at every command, it would not take long to control the situation. Do not try to stop the catalogue houses. If you are behind, catch up and get in the lead. If you are in the lead, work to stay there and keep there.

SUMMARY.

I sum it up like this: If the manufacturers think more of the catalogue houses than they do of the jobbers, let them sell the catalogue houses exclusively; the jobbers can attend to that. If the jobber thinks more of the catalogue house trade than he does of the retailer's, let him sell to the catalogue house exclusively and let the retailer see to that. If the manufacturer wants to sell to us and sells cheaper than the jobber, then it is the duty of the jobber to cut prices to meet the manufacturer's prices, the same as we retailers have to cut prices to meet catalogue house competition. Make every jobber and manufacturer declare himself. Start at the head. Let the jobber see that the manufacturers confine their sales to the jobbing trade and let the retailers see that the jobbers confine their sales to legitimate Hardware dealers, and when this is done we retail dealers will understand better how to dodge the bullets. But when they are pouring hot lead into us from every side we do not know whether to stand or run; but when we know the source of the firing I think we can fortify ourselves and make a winning.

Every one knows that the fight is to be made by the retail dealers, and if the jobbers will furnish us the right kind of ammunition and we do not waste it for profit makers we will certainly win the battle. It takes united action to accomplish anything. The retail dealers, jobbers and manufacturers should handle this catalogue proposition through their respective associations, and in order to do that successfully every one in sympathy with us must enlist.

Heating and Ventilating.

BY O. N. ROBERTS, ROBERTS HEATING & VENTILATING COMPANY, MINNEAPOLIS, MINN.

Artemus Ward, who was not a great lover of snakes, used to say that a snake's hole always reminded him of the fact that the hole belonged to the snake. To quite the same extent, although in not exactly the same way, I believe that the furnace business belongs to the Hardware dealer. Moreover, the furnace business is unquestionably one of the Hardware dealer's most valuable assets, because it is one of the few things that can never be successfully carried on by department stores or supply houses. Fancy a 15-year-old girl with chewing gum in her mouth and a red ribbon around her neck making up an order for the material necessary to put in a heating plant for a 14-room house.

There are merchants who will not handle furnaces because they think it is impossible for furnaces to give satisfactory results, and their conscience as well as their business sagacity tells them that it is not well or wise to sell gold bricks to customers, no matter how eager they may be to buy. Now, it is easy to understand why a merchant should refuse to handle a line of goods in which he has no confidence, but why he should choose to remain in ignorance of the real value of warm air heating when there is so much at stake is a mystery.

For ordinary residences there is nothing in my opinion that will give more universal satisfaction than up to date warm air furnaces properly installed. I know there is a prevalent opinion that hot water plants require less fuel than warm air, but my personal experience has convinced me that this is not true except in houses where it is impossible to secure comparatively short runs for the warm air pipes and a thorough system of inside circulation.

Moreover, the difference in price between warm air and hot water plants will always give the former preference among people of moderate means, while those who prefer a practicable system of ventilation in connection with their heating plant and who appreciate the advantages of securing quick changes in the house temperature during the spring and fall will certainly decide in favor of furnace heat.

There is another system of heating, however, that combines many of the good features of both warm air and hot water; I refer to what is known as combination heating. Of course, if all houses were so arranged that every room could be directly reached by warm air pipes there would be very little need for combination heat except, perhaps, in some very exposed corners, but there are usually in large houses some rooms that cannot be heated successfully by any other method than hot water.

Selling Goods.

BY B. A. GRIM, MICHIGAN STOVE COMPANY, DETROIT.

The basic principle in merchandising is to get a profit on the goods sold. In order to do this a desire for the article sold must be created in the mind of the purchaser. This may be accomplished in several ways. The most common at present is for the maker of the article to advertise its merits, setting forth its utility, desirability or virtue. This assists the merchant to market it. With goods of this character he must impress the buyer with the name of the article and connect himself locally with the national advertising done by the manufacturer.

There are certain goods whose finish, form and intrinsic merit make them more desirable than similar articles of cheaper production whose construction costs less, but by the glittering descriptions set forth by catalogue houses are made to appear the equal of goods sold by the merchant. It requires tact and salesmanship on the part of the merchant to counteract this impression in the mind of the farmer.

THIS IS THE STUMBLING BLOCK

not only of the merchant but of the traveling salesman himself who fails to impress the merchant with the many points of merit of the goods under consideration. If you are selling goods that have real merit impress it on your customer and imperceptibly it will grow on you that what you are saying is a real truth, and the selling of such articles becomes a religion. Your indorsement comes with such a firm conviction of truth to the buyer that he is at once impressed with your sincerity and the sale is made. You can never make another man believe something of which you yourself are not firmly convinced.

Merchants often say to me, "I cannot sell such and such an article." I am always glad to hear a man thus express himself. It shows conscientiousness, which is the real basis of all character. Here is a man whose confidence is worth something, in whom the buying public will soon learn to trust, and lucky is the salesman who secures his business.

The one secret of all merchandising is to make the other man *want your goods*. Pick up the catalogues of the houses that sell direct to the farmer and their graphic descriptions read like a chapter from "The Arabian Nights." They are trying to make the other fellow want their goods. The merchant and the traveler are drowning in the same stream. Let us each use the gifts that we are supposed to possess.

JAMES I. WEBB, Hamden, Conn., has been elected president and treasurer of the Mt. Carmel Bolt Company, Mt. Carmel, Conn., succeeding the late Willis E. Miller. Several important changes are being made in the methods of conducting the business. The company manufactures Tire Bolts, Stove Bolts, Rods, Rivets, Nuts and Machine Screws.

Wisconsin Retail Hardware Association.

As was stated in *The Iron Age* last week, the ninth annual convention of the Wisconsin Retail Hardware dealers' Association was by far the largest in point of attendance in the history of that organization, it being estimated that, while the association has a membership of but little over 400, there were 350 members present. The convention was also a success from the standpoint of the interest and value of its discussions, although the fact that there were only three half day sessions made it necessary to give but limited attention to some topics and to omit others altogether. Provision has been made to have four sessions next year.

The first session of the convention was called to order at 2.30 p.m. Wednesday, February 1, by the president, H. L. McNamara of Janesville. Mr. McNamara delivered his annual address, which was published in full in last week's issue. Mr. Peck followed with his report as secretary-treasurer, which was also presented in our last issue.

R. R. Williams, Hardware Editor of *The Iron Age*, on the invitation of the president addressed the meeting at length. At the close of his address the association, by rising vote, made Mr. Williams an honorary member. A resolution was passed conveying through Mr. Williams appropriate fraternal greetings to the North Dakota Association, which was in session and which Mr. Williams had announced that he would attend the following day.

Convention Committees.

The following convention committees were announced:

TRANSPORTATION: E. H. Ramm, New London.
AUDITING: C. Ernest Dewey, Kenosha; J. Montgomery, Wausau.
PRESS: J. C. Lewis, Antigo; P. J. Jacobs, Stevens Point.
QUESTION BOX: Mr. Martin, Martin & Kuebler, Viroqua; Arthur Heins, Tigerton.
LEGISLATION: J. Kornely, Milwaukee; H. C. Scofield, Sturgeon Bay.
RECEPTION: F. Merback, Ripon; J. Hughes, Fond du Lac; John Hessel, Antigo; O. A. LaBudde, Elkhart Lake.
RESOLUTIONS: F. J. Senghush, Burlington; Henry W. Wernicke, Manitowoc; J. Montgomery, Wausau.
SERGEANT-AT-ARMS: H. Schupinsky, Milwaukee.

Address on Salesmanship.

Lewis Cass Hitchcock, representing the Sheldon School of Scientific Salesmanship, Chicago, delivered an address on "Salesmanship," which followed the lines of Mr. Sheldon's talks, which were reported fully in *The Iron Age*, as delivered at the Minnesota, Indiana and Iowa conventions last year.

Greetings from the Iowa Association.

L. Lindenberg was present as a representative of the Iowa Retail Hardware Dealers' Association and spoke briefly. He said:

I bring a message of good will and cheer. The Iowa Association has been very fortunate in securing new members. At present we have a membership of 400. The insurance feature is very flourishing. We have been writing insurance two years and our total losses are less than $100. This shows that the Hardware risks are the very best. The insurance feature is one of the best, because one of the most tangible, advantages of these State associations. It shows immediate results. Any member who carries $3000 to $5000 of this form of insurance can save enough as compared with the regular board rates to pay the expense of his trip to the annual convention and his dues as well.

Talk on Insurance.

Secretary Peck addressed the convention on Insurance. He said:

We ought to have $1,500,000 worth of insurance on our books and would have if every member of this association was loyal to it. It will interest you to know that I have been instructed by the Board of Directors hereafter to pay all fire losses in full without deducting the 1 per cent. for cash in 48 hours, as is done by the standard companies, and to send the check in full without any discount, as is done by English companies. We have 401 members in the Hardware association and if each one would carry $3000 in our insurance company it would make a magnificent showing. Some people object to our requiring that they shall carry at least $500 in old line insurance. We have to do this because we are not insurance experts and it is the only safeguard we have. As it is, we do not care what risks or exposures a building has, provided its people secure old line insurance and give us a rate commensurate with the risk.

We are paying to our policy holders this year 20 per cent. rebate on premiums and I hope will be able to pay 35 per cent. next year. This is not an assessment company, but there is one clause in our charter which says that policy holders shall be liable for three times the amount of the premium which they pay the association. That means that if for any reason our company should be crippled because of a great series of fires, members of the company can be assessed three times the amount of the annual premium on what insurance they carry. At most this would not exceed $50 or $60, and the probability of such a state of affairs happening is very remote. Our company is in fine shape financially and you will get your money if you have a fire. We have now nearly $500,000 worth of insurance written.

Stereopticon Lecture.

R. B. Watrous, secretary of the Citizens' Business League of Milwaukee, delivered a stereopticon lecture on Milwaukee during the first hour of the Thursday morning session. The lecture was listened to with great interest by the members and Mr. Watrous was given a vote of thanks at the close of his address.

Profit on Side Lines.

H. F. Krueger of Neenah read a brief paper on "Profit on Side Lines," which we print in full, as follows:

Many of the old members present will remember when the word Hardware did not imply one-fourth as much as it does to-day, when our General Hardware catalogues were mere pamphlets compared to the enormous books of to-day. In the last 20 or 25 years the branches of the Hardware business have been greatly developed. The time was when three or four Stoves represented an entire line, when if a customer wanted a Wrench or a Hammer, a Saw or a tool of any kind, you had one or possibly two different sizes or styles to show him. You had a few common Locks, Knobs and Hinges in your line of Builders' Hardware.

We have seen great changes since those days. A line of Stoves to-day may be ten or it may be 50 different patterns and sizes. You may have anywhere from four or five to a dozen different kinds in size and style of the same tool. The line of Builders' Hardware is unlimited in the variety of styles, finishes and designs. In other words, where one or two patterns of an article represented a dealer's stock, he now carries a line of perhaps a dozen or more styles, sizes and patterns. All this tends to increase his stock of General Hardware to many times its former size.

SIDE LINES WHICH ARE NOW REGULAR HARDWARE.

Notwithstanding the fact that Hardware stocks are, as a rule, much larger than in former years, and that the public demands a greater variety from which to choose, many dealers have added as side lines in like quantity and assortment such goods as Mill Supplies, Agricultural Implements and Machinery, Bicycles, Sporting and Athletic Goods, and a great deal of extra shop work, including plumbing and hot water heating. Many of these can no longer be called side lines of the General Hardware business, having been so long a part of both retail and wholesale Hardware lines.

OTHER ADDITIONS.

In spite of all this increase there seems to be still further demand for additions to our lines. In some cases Lamps, Crockery, Glassware or Silver Ware have been added. Other dealers carry a line of Trunks, Grips and Hand Bags. Still others handle Harness, Wagons, Carriages and Vehicles of all kinds. Quite a number have furniture. We ourselves added the furniture line about eight years ago, and it has proven very satisfactory. We

have given it a space on our second floor 30 x 115 feet. We have installed a passenger elevator, which makes our furniture department practically as convenient as though it were on the ground floor. We carry a general line of good, substantial goods necessary to equip a modern home, also a line of Baby Carriages and Go-Carts, Carpets, Mattings and Rugs, including large Rugs in carpet sizes.

A SUGGESTION.

In adding any side line to your regular business, it is much better to give this new addition a separate space or department independent of the rest of the stock. See to it that you have a complete assortment; keep the goods well arranged and priced with modest profits, and from time to time display these goods in your show windows, at the same time advertising them as much as the line will warrant. Last, and more important than all, remember the old adage, that "Goods well bought are half sold."

BUYER SHOULD BE CAUTIOUS.

It is without doubt a fact that under present business conditions the average buyer is apt to pay too much for goods, no matter what the line may be. You may take up any catalogue or price-list pertaining to any line you choose, and it is safe to say that at least 75 per cent. of the goods carry trust, combination or agreement prices.

H. F. KRUEGER.

Take, if you choose, your catalogue of General Hardware; on most of the goods, if the prices are not agreed upon by the manufacturers, they are by the jobbers, and with these conditions, unless the buyer is very cautious, he will be paying more for goods than the consumer can obtain them for from the mail order houses.

Catalogue House Prices, Especially on Stoves.

Mr. Krueger followed up his paper with an extemporaneous address, in which he laid before the association many startling facts and figures in relation to the selling prices of catalogue houses, particularly on Stoves, one instance being cited where a Stove which the retailer would have to market at $50 to show even a living profit was being sold direct to the consumer by the catalogue house at $25. Mr. Krueger said: "They tell us that we must talk quality in order to prevent the purchase of Stoves and other goods from mail order houses, but what I would like to know is how you can sell to your customer $25 worth of Stove and pump into him $25 worth of quality talk. There are many inequalities of price on kindred articles. For instance, Radiators can be bought at from 2½ to 4 cents a pound, while Water Fronts are charged at the rate of from 10 to 12 cents a pound. The last time I bought several dozen Stove Shakers I weighed them and found that they were charging me between 18 and 19 cents a pound. They were common cast iron, nickel plated. Why, I can go to a brass foundry and have them made of solid brass, nickel plated, for less money than that! Stoves are too high in price in proportion to the cost of materials that go into them. Even the Stove Bolts, which cost about 6 cents a pound in the regular way, cost us 8 to 9 cents a pound in the Stoves. We are told that Stoves that are being sold so cheaply by the mail order houses are made out of poor materials and that that is the reason for the great difference in price. Suppose a Stove weighs 400 to 500 pounds; the difference between the best and the cheapest pig iron that can be used in a Stove would not be more than $4 to $5 a ton, making the difference in cost between the best and cheapest iron in one Stove something like $1. On the other hand, they tell us that when labor goes up and they advance the price of Stoves it is labor that costs, and that 75 per cent. of the cost of the Stove is labor."

A discussion followed in which a short talk was made by Henry Volkmann of Kingston, who said that though he had been 36 years in business he felt that he was gradually losing his Stove trade, because he could not meet the catalogue house prices. Other members talked in the same vein, but a number stated it as their conviction, based on careful study, that the mail order houses were losing rather than gaining ground in their localities.

Protesting Against Prices on Stoves.

On Mr. Krueger's motion a committee of five was appointed by the chair to draw up resolutions expressing the association's protest against the present high prices of Stoves. The chair appointed C. E. Dewey, Kenosha; O. P. Schlafer, Appleton; O. A. LaBudde, Elkhart Lake; J. Kornely, Milwaukee; Henry F. Krueger, Neenah. The resolution adopted by the committee reads as follows:

Resolved, That it is the sense of the retail Hardware dealers of Wisconsin, in convention assembled, that the purchase prices asked by the leading Stove manufacturers for their medium and higher priced Stoves and Ranges are too high and not in proportion to the present cost of raw material and labor entering into their manufacture; and be it, therefore,

Resolved, That they adjust their prices in proportion to the prices of other articles manufactured of like material and labor, and that a copy of these resolutions be submitted to the National Stove Manufacturers' Association, asking them to take action as to same.

Benefits of Local Associations.

Andrew Esser of Hartford read a brief paper on "Benefits of Local Associations," in which special reference was made to the Hartford Retail Merchants' Association, which was organized in May, 1904, and now has 15 members.

The paper was followed by extemporaneous remarks, in which Mr. Esser said: "This association protects its members against loss through deadbeats. It was started last April and has been the means of collecting bills that have been outstanding quite a number of years. We have a young lawyer as our secretary. The merchant first gives the delinquent a ten days' notice; then if that fails to bring the payment the secretary notifies him, giving a stated time in which to pay the amount, and if this is not met or satisfactorily arranged the man named is put on the list of delinquents and he can buy no merchandise from any member of the association."

Question of Exhibits.

Complaint was so general that members of the association were drawn from the business session by the exhibits and exhibitors that a resolution was introduced by A. G. Kroncke of Madison that it be the sense of the association that all manufacturers and jobbers refrain from giving exhibits at the annual conventions. This resolution resulted in very vigorous discussion, in which the preponderance of sentiment was strongly against the resolution. Many argued that small dealers from all over the State came to the convention quite as much to see the exhibits as to attend the conventions and that the exhibits were of great value to them, as they had no opportunity of seeing the new things elsewhere. It was finally announced that the local manufacturers and the Milwaukee Manufacturers' Association had given the officers of the Hardware association assurance that between now and next year arrangements would be made for holding the meeting in some larger hall or building where there would be ample room for exhibits and where it could be arranged that during the active sessions the exhibitors would withdraw.

Mail Order House Competition.

On motion by C. E. Dewey a committee of five was appointed to suggest plans for meeting and overcoming mail order and other low priced competition.

A Few Things That Will Help the Retailer.

James Watson of Marinette read a paper under the above title, as follows:

I wish to speak of a few rules, rates and prices that are unfavorable and the correction of which would be beneficial to the retail Hardware dealer. First, I would mention the extras on mild steel and iron, known as quantity differentials—not the extras between sizes. You are all no doubt familiar with the fact that manufacturers require us in making up a car to take a ton or more of each size before they will give us the price quoted on car lots, and on quantities of less than 1000 pounds of any size in the car we are compelled to pay an extra charge at the rate of 30 cents per hundred. It has been suggested that purchasing from the jobber would be a remedy for this, but the jobber is governed by rules laid down by the manufacturer and conditions would not be changed if shipment were made from factory.

The evils that take root from this ton limit are many. In the first place, it results in a very poorly assorted stock, and we are unable to make a living profit from the sale of any sizes purchased in quantities less than a ton; and the working capital of many Hardware merchants, espcially those in small cities and towns, is inadequate to carry large stocks of steel and iron. For example, three-quarter round is a good seller and of that special size nearly every Hardware merchant can carry a ton or more, but of the next larger size but a few bars need be carried, and yet we must pay 30 cents per hundred more for it than for the three-quarter round, while the intrinsic value of the grades is the same and brings the dealer the same price; and then, again, these conditions make it very difficult to keep track of the exact cost of our stock of iron. I would suggest as a remedy for this ton evil that we put forth an extra effort to have iron handled the same as Nails, the jobber getting his profit according to the quantity of carloads. This would establish for the retailer a basis of cost on his stock of mild steel or iron.

FREIGHT RATES ON TWINES AND CORDAGE.

I would also like to call your attention to railroad freight rates as they apply to Twines. The materials used in the manufacture of Lath Yarn, Binder Twine and Rope are about the same, and one is no more expensive to manufacture, handle or ship than the other two, and to illustrate the discrepancy I would cite the rate at the present time on Twine shipments from Boston to Marinette. Lath Yarn and Binder Twine are classified as class 6 at 23½ cents; Rope as class 5 at 28 cents. This discrepancy would cut no figure if the three commodities could be put into one car, but should a mixed car of these goods be shipped the shipping rules would be violated and the freight billed out at 47 cents per hundred. You will note that the carload rate on Binder Twine and Lath Yarn is the same, and that Rope, together with them, is rated the same in less than carload lots. Rope and Lath Yarn may be shipped in one car at the Rope rate, while Binder Twine cannot be shipped in the same car with either as a carload. Now, if we dealers were permitted to make up a carload of the three it would then be possible for us to make a profit on Binder Twine.

I would also like to say a few words about Cross Cut Saws. The manufacturers of these Saws provide for a margin for the jobbers, and also enforce an agreement that the jobber must not give any part of his margin to the retailer. He is to give the dealers 35 per cent. off. The manufacturer, however, quotes the retailer's price to the larger consumer. Now, should we not ask the manufacturer to give a protective margin to the dealer as well as to the jobber? This criticism would apply to the manufacturers of other goods besides Cross Cut Saws.

DEPARTMENT STORE COMPETITION.

We also find ourselves placed in embarrassing positions by some Stove manufacturers, especially those of us who are up against the department store proposition. The Stove agent calls on the dealer and informs him that unless he receives a satisfactory order he will place the line with the department store or furniture establishment. The capacity for handling Stoves is limited with most dealers doing a general Hardware business, and very often the agent who thus endeavors to frighten a large order from the dealer is turned down. I think the condition of affairs in the Stove department of our business could be materially bettered and would suggest that each member of our association be furnished with a list of manufacturers who sell to exclusive Hardware dealers only.

It is a well-known fact that the best Hardware is found in the store of the exclusive dealer, and I have watched very closely the system employed by some department stores to make the regular Hardware merchant's prices appear ridiculously high. Some department stores handle the better grades of goods along with a much larger stock of seconds, thirds and inferior brands. As a rule they make their money on a low grade of goods, for which they charge enormous prices, the profits on which give them a wide margin in which to drop down to bargains and still net a handsome profit.

JAMES WATSON.

An Advertising Campaign.

At the close of his paper Mr. Watson told of the success with which the merchants of Marinette had carried on an advertising campaign in order to protect their interests against an aggressive department store. The grocers, the Hardwaremen and dealers in other lines of goods joined together in running a composite advertisement in the daily papers, the advertisement quoting low prices on a great number of different lines and the introduction to the advertisement containing a strong plea to the citizens of the town to give their patronage to old established, reliable firms instead of to the department stores. The grocers, he said, were at first disposed to give up without a fight when the department stores began advertising groceries, but the Hardwaremen inaugurated a fighting plan and the grocers finally came in with them. Later on the grocers thought they could run the scheme alone and fell down in the attempt. Mr. Watson advised the members to try the plan in other towns, suggesting that all dealers should enter into an agreement or contract by which they would pool their advertising outlay for at least one year.

Letter from M. L. Corey.

M. L. Corey, secretary of the National Retail Hardware Dealers' Association, who was unable to be present, sent a letter in which he dwelt on the catalogue house question, referring to it as "the paramount issue for 1905," and also on parcels post. He urged that the members take action protesting especially against House Bill No. 17,116, which is based upon the recommendations of

Assistant Postmaster-General Bristow, which, while it might prove of some slight benefit to the retail merchants, might prove the entering wedge for a domestic parcels post. Mr. Corey referred to the National Association's relations with manufacturers and jobbers as of the most friendly character and to the outlook for future influence and usefulness as most encouraging and gratifying.

Against Trading Stamps.

The Committee on Resolutions presented the following:

Recognizing the injurious effects to legitimate trade resulting from the use of trading stamps, be it, therefore

Resolved, That the Wisconsin Retail Hardware Dealers' Association recommend the passage of Assembly bill 23A, introduced by Mr. Thieme, prohibiting the giving of trading stamps, coupons or other devices upon the sale of goods, and it is the sense of this association that each member thereof use his efforts to influence the Assemblyman for his district to work for the adoption of this bill.

Resolved, That a copy of this resolution be sent to each member of the Legislature.

Mr. Thieme's bill provides a penalty of from $10 to $500 and imprisonment for from ten days to one year to enforce this act. There is nothing in the bill that would prevent a dealer from giving out coupons or stamps or checks of any kind entitling purchasers to items from his own stock, as the bill is aimed exclusively at the big trading stamp corporations.

R. M. BURTIS, President.

Talk by Mr. Norvell.

S. Norvell of the Norvell-Shapleigh Hardware Company, St. Louis, chairman of the Wholesale and Retail Joint Committee, addressed the meeting, and when he got through his hearers had pretty well in mind the fact that the jobber has troubles as well as the retailer. Mr. Norvell emphasized the fact that selling was a much more important operation than buying. Said he, "God have mercy on the man who is a good buyer, but who cannot sell the goods he buys. If you are spending 75 per cent. of your time on buying and 25 per cent. on selling, reverse the ratio and devote at least 75 per cent. of your effort to selling. Every head of a mercantile house must be a school teacher. He must be teaching his clerks and his whole force up to date ideas on salesmanship. There is not 5 per cent. difference in the cost of the Hardware stock, item for item, of the poorest buyer and the best buyer in the State of Wisconsin, but stocks do vary 25 to 50 per cent. in value as to their assortment and character. There is nothing more untrue than the old statement, that 'goods well bought are half sold,' if well bought means cheaply."

Delegate to the Michigan Convention.

C. A. Peck, the secretary, made a report on his visit to the Michigan State convention, held at Grand Rapids last August. He said that one difficulty that Michigan labors under is the fact that so much of its territory is west of Lake Michigan. A good many of these northern Michigan dealers had asked to become members of the Wisconsin Association, and Mr. Peck had secured from the secretary of the Michigan Association permission to take in some of them.

Election of Officers.

Ralph M. Burtis of Oshkosh, the present vice-president of the association, was elected president for the coming year. Emil Teitgen of Manitowoc was elected vice-president, and C. A. Peck of Berlin was re-elected secretary and treasurer, the convention expressing its vigorous and hearty approval of Mr. Peck's efficient administration. The terms of two directors, R. C. Murdock, Beloit, and H. C. Scofield, Sturgeon Bay, expiring, James Murphy, Racine, and H. F. Krueger, Neenah, were chosen in their places.

EXHIBITS.

The Republican Hotel was inadequate to the unusual demands for space for exhibits. As it was every available inch of space in the first two floors was taken, with overflows in the basement and on the third floor. A noteworthy feature in connection with the exhibits was the unusual volume of business that was booked. Ordinarily exhibitors do not expect to sell much at conventions. Their displays are made for the purpose of advertising and orders are only incidental. It was a matter of surprise, then, that so many orders were taken for so many lines—notably Stoves and Heaters. Following is an alphabetical list of exhibiting firms, with names of men in charge and goods shown:

E. C. ATKINS & Co., Indianapolis, Ind., complete line of Saws. Exhibit in charge of W. E. Stalnaker, Chicago manager; S. M. Perrigo, G. W. Dunnington, P. L. Edwin, H. P. Hughes. Souvenir, an Aluminum Comb in the shape of a Back Saw.

ART STOVE COMPANY, Detroit, line of Laurel Stoves and Ranges, represented by E. J. Hahn and Mr. Arndt.

ESTATE OF P. D. BECKWITH, Dowagiac, Mich. Represented by G. T. Adams and A. E. Rudolphi, showed the full line of 1905 Round Oak Stoves and Ranges. Decorated china Lunch Plate souvenirs.

BARRETT MFG. COMPANY, Chicago. W. R. McEuen, W. J. Walker and W. T. Adams, exhibited samples of Black Diamond and Amatite Roofing. Gave rubber eraser souvenir.

COLE MFG. COMPANY, Chicago, by H. L. Bangs, O. C. Harrison and A. D. Stewart, showed the new line of Coleized Hot Blast Steel Ranges, as well as the regular line of Hot Blast Stoves and Heaters.

GEO. M. CLARK Division of American Stove Company, Chicago, by E. B. Martin, line of Jewel Gas and Gasoline Stoves and Ranges and a new air tight Jewel Sheet Iron Wood Stove. Gave a Nickel Plated Wrench souvenir.

COOK MFG. COMPANY, Albion, Mich., by Bert Joseph, State manager, photographs of Stationary and Portable Gas and Gasoline Engines, from 2½ to 20 horse-power.

CRIBBEN & SEXTON, Chicago, by J. W. Elliott and J. D. Steele, line of Universal Steel and Cast Ranges and three lines of Base Burners.

COMSTOCK-CASTLE STOVE COMPANY, Quincy, Ill., by F. McCabe and J. H. Bannon, full line Economy Stoves and Ranges.

ABRAM COX STOVE COMPANY, Chicago, by J. W. Roraback and H. W. Rusco, line of Novelty Stoves and Ranges and Classic Steel Ranges.

DEERE & MANSUR, Moline, Ill. M. E. Wait, Plows; S. N. Vrooman, Corn Planters. Pocketbook and stick pin souvenirs.

DIAMOND SPIRAL MFG. COMPANY, Tinley Park, Ill., by J. M. Rauhoff, Diamond Spiral and Crackerjack Washing Machines.

ELLIOTT MFG. COMPANY, Warren Ill., J. J. Walton, Western manager, Elliott Anti-Rust Tinware.

C. H. FOSTER, St. Louis, Mo., by R. M. Clark, Foster Side Wall Registers; headquarters St. Charles Hotel.

WM. FRANKFURTH HARDWARE COMPANY, Milwaukee, E. H. Streissguth, presented delegates with loose leaf perpetual want book.

GERMER STOVE COMPANY, Erie, Pa., by W. W. Barrick, Chicago, and Henry Meinshausen, Wisconsin salesman, showed complete line of Radiant Home Stoves and Ranges and two Hot Air Furnaces.

GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, by M. O. Chamberlin and R. H. Zinke, Opaline, Cream City and American Blue-and-White lines of Enameled Hollow Ware. Souvenir Ash Trays.

HIBBARD, SPENCER, BARTLETT & Co., Chicago, exhibited Sporting Goods at the Plankinton Hotel, in charge of A. P. Reiter and five assistants.

HUNT, HELM, FERRIS & Co., Harvard, Ill., represented by B. B. Bell and Frank Colmes, Jr., Hay Tools, Tank Heaters, Coasters, Wagons, Sleds &c.

JOLIET STOVE WORKS, Joliet, Ill., represented by H. W. Smith. Large exhibit of Moore's Excellent Base Burner Stoves and Ranges.

F. & L. KAHN COMPANY, Hamilton, Ohio, represented by Nesbit & Strayer of Minneapolis. Line of Estate Stoves and Ranges.

LANDERS, FRARY & CLARK, New Britain, Conn., New Universal Bread Maker, demonstrated by T. L. Reddick.

LAWRENCE BROTHERS, Sterling, Ill., represented by Ed. F. Lawrence and B. F. Isbell. Large display of Hinges, Butts, Latches, Hangers and other Hardware Specialties.

LISK MFG. COMPANY, Canandaigua, N. Y., gave souvenir miniature Dinner Pails and Enameled Ware Dishes to advertise its Antirust Tinware and Enameled Ware.

LOWE BROTHERS COMPANY, Dayton, Ohio, display of Liquid Paints in Schlitz Hotel, in charge of H. S. Houk.

LYONS SPECIALTY COMPANY, Lyons, Iowa, represented by Wm. Peterson. Samples of Everlasting Barn Door Latch and Holder and patent Cast Iron Chimney Cap.

MALLEABLE IRON RANGE COMPANY, Beaver Dam, Wis., represented by Silas McClure, secretary, and James Brown, showed Monarch Ranges. Gave oxidized silver badge reproducing trade-mark.

MALLEABLE STEEL RANGE COMPANY, South Bend, Ind. Steel Ranges.

MILWAUKEE PAINT & VARNISH COMPANY, distributers for Peninsular Paint & Varnish Company of Detroit. Large exhibit with nine salesmen in attendance.

MILWAUKEE CORRUGATING COMPANY, Louis Kuehn, president; Wm. Jahn, secretary; J. E. Tracy and J. L. Larson. Booth built from Ornamental Steel Roofing and Siding containing long line of Galvanized Staples and Specialties. Souvenir, a Metallic Turtle Paper Weight.

MILWAUKEE STOVE & HEATER COMPANY, W. G. Powell, president; W. J. Breese, secretary and treasurer; Mr. Illian, Wisconsin representative, showed its line of Milwaukee Furnaces and an assortment of Detroit Vapor Gasoline Stoves and Heaters.

L. J. MUELLER FURNACE COMPANY, Milwaukee, represented by E. S. Seims, L. J. Mueller, Jr., E. F. Schlecht and M. B. Garnsey, showed line of Mueller Furnaces and Side Wall Registers. Gave a rotary coin purse souvenir.

1900 WASHER COMPANY, Binghamton, N. Y., represented by J. F. Le Bonty, local sales agent.

NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo., presented each member with an Enameled Drinking Cup.

JAMES E. PATTON COMPANY, sales agent for Patton Paint Company, Milwaukee, represented by L. W. Bowman, Samuel Schwartz and C. F. Ehle. Large exhibit of Paints, Varnishes and Sundries. Tin Dice Box souvenir in shape of a miniature Paint Pail. Also souvenir sunflower pin.

C. A. PECK HARDWARE COMPANY, Berlin, Wis., Stove and Barrel Trucks, Gem and Jewel Rural Mail Boxes.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa., represented by E. Steyeler, general manager of Wire Fence department, and E. C. Burdick. Exhibited Electrically Welded Fence, Field and Garden Fence and Poultry Netting. Gave oxidized silver badge.

J. PRITZLAFF HARDWARE COMPANY, Milwaukee, represented by E. G. Davies and others, gave handsome celluloid calendar souvenir.

RATHBONE, SARD & Co., Aurora, Ill., represented by Frank Bowman and C. N. Pratt. Large exhibit of Acorn Stoves and Ranges.

REED MFG. COMPANY, Newark, N. Y., represented by F. J. Frederickson, State agent. Large display of Tin and Enameled Ware. Metal Match Safe souvenir.

ROBESON CUTLERY COMPANY, and ROCHESTER STAMPING COMPANY, Rochester, N. Y. J. E. Booth, D. A. Lewis, R. H. Henderson and Mr. Smalley. Large display of Enameled, Galvanized and Antirust Tinware, Painted Ware, Argentine and Nickel Plated Ware, Table Cutlery, Razors and a general line of small Edged Tools.

SHARPLES SEPARATOR COMPANY, Chicago, represented by A. W. Main, exhibited 1905 Separators. Presented Match Safe souvenir.

SIMONDS MFG. COMPANY, Chicago, and Fitchburg, Mass., represented by Van Dyke, Jr., W. J. Feddery and R. Baldwin. Large exhibit of Saws. Gold Hand Saw badge souvenir.

STOWELL MFG. & FOUNDRY COMPANY, South Milwaukee, Wis., represented by Robert Moscrip, M. J. Evans and R. A. Nourse. Exhibited Boyd Hay Carriers, with new "bring back" attachment. Also other Hardware Specialties.

THE H. D. SMITH & Co., Plantsville, Conn., presented to every member of the association a box containing two of their Perfect Handle Screw Drivers.

STERLING MFG. COMPANY, Sterling, Ill., represented by Robert Moscrip, all Steel Carpet Sweeper.

STOWELL MFG. COMPANY, Jersey City, N. J., represented by Geo. W. Faye, M. B. Hood and T. E. Erringer, exhibited Roofing Materials.

O. E. THOMPSON & SON, Ypsilanti, Mich., represented by O. H. Thompson, exhibited Ypsilanti line of Adjustable Kraut Cutters.

VOSS MFG. COMPANY, Davenport, Iowa, represented by Chas. E. Mearns, sales manager, Ocean Wave Washers.

WELLS & NELLEGAR COMPANY, Chicago. Line of Steel Goods, shown by H. M. Gay.

WESTERN STEEL GATE COMPANY, Two Rivers, Wis., represented by Morley-Murphy Hardware Company, Green Bay. C. W. Vandewalker, president; E. W. Knapp and J. H. Noble. Steel Gates and Post Hole Diggers.

WHEELING CORRUGATING COMPANY, Wheeling, W. Va., represented by W. J. Norris. Stamped Hip Shingles, Corrugated Stove Pipe Elbow, Tin Plate and Painted and Galvanized Roofing and Siding Materials.

WISCONSIN FOUNDRY & STEEL WORKS, Milwaukee. Line of Steel Ranges, shown by A. M. Antoine.

THE GROWTH OF THE ATKINS SAW WORKS

EVIDENCE of the successful development of an idea is presented in the growth that has attended the Saw manufacturing establishment of E. C. Atkins & Co., Indianapolis, Ind. Superiority in quality was the idea which predominated in the production of the Atkins brand of Saws from the casting of the steel ingot to the finished article. The Atkins brand of Saws may be rightly entitled to its inception away back in the seventeenth century, when the Atkins ancestors were making Saws in England and have continued there and in this country in an unbroken line down to the present time.

The success of this institution was primarily due to the mechanical genius of its founder, E. C. Atkins, who established the business in 1857, alone and without capital, though endowed with abundant energy and perseverance. His knowledge and experience in Saw making were obtained in the Saw factory of his father, then operating in Bristol, Conn. But the great prosperity which has attended the business of the past few years is accounted for by the fact that not only the present head of the firm, H. C. Atkins, but every department superintendent, is an expert in his particular line, and quality is his watchword. The skilled mechanics in the Atkins factory (and they comprise more than half of the employees) are the highest paid workmen in Indianapolis.

Less than 20 years ago the factory employed about 150 men and opened its first branch house at Memphis, Tenn. A short time afterward another branch was started in Chattanooga, which later was removed to Atlanta. Then in rapid succession branches were established at Minneapolis, Minn.; Portland, Ore.; New York City; Chicago, Ill.; Toronto, Ont.; Seattle, Wash., and lastly a San Francisco branch was opened January 1 and was necessitated because of the firm's increased business on the Coast, which could not be accommodated to advantage from Portland and Seattle.

To take care of its rapidly increasing trade the firm is constantly expanding its manufacturing facilities and several new buildings have lately been equipped and put into operation. About 1200 men are now employed at the factories and 70 salesmen are kept constantly on the road disposing of the product of Saws and Tools, whose alliterative trade-mark is "Atkins Always Ahead."

THERE was a small fire in the basement of V. P. Humason's store at 80 Chambers street, New York, Friday night, February 3. The loss was slight and there will be no interruption to business. Mr. Humason represents the Humason & Beckley Mfg. Company, William Rogers Mfg. Company and Chapin-Stephens Company, who are manufacturers of Hardware, Silver Ware and Rules, in the order named.

The New Hardware Store of Hammacher, Schlemmer & Co.

SIXTH ARTICLE.

HAMMERS.

In Fig. 57 is shown the arrangement of one of the drawers in which Hammers are carried.

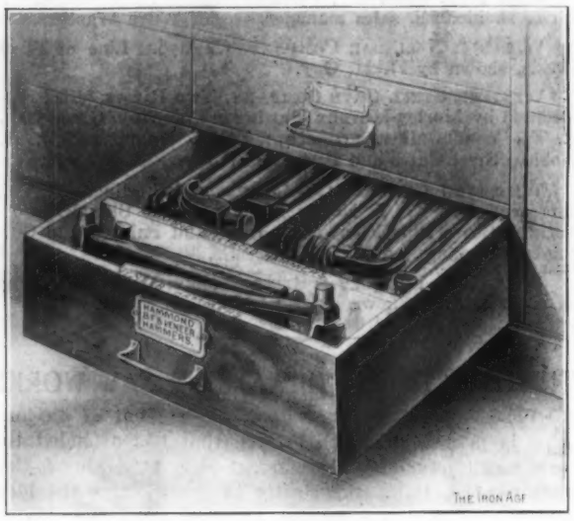


Fig. 57.—Hammer Drawer.

SAWS, BRACES AND PLANES.

A partial view of the wall case back of the show window is given in Fig. 58. This contains Saws, Braces and Planes.

Fig. 58.—Saw Wall Case.

Cross Cut and Rip Saws stand on the bottom of the case, as shown in Fig. 59, with division pins between. These are made of ½-inch brass plated pipe fastened to the back of the case by floor flanges and provided with a cap on the outer end. The size and kind of Saws between each pin are marked on plates secured to the floor of the case just back of the sash sliding rail. The kinds of Saws hung on similar pins above include Back, Pruning, Plumbers' and Joiners'. Bracket, Jewelers' and Butchers' Saw Frames are also hung on pins.

BIT BRACES.

The specially designed rack for Braces, shown in Fig. 59, is made of brass rods 11 feet long, with supporting brackets 32 inches apart. This provides for an elastic stock, a larger or smaller stock being accommodated

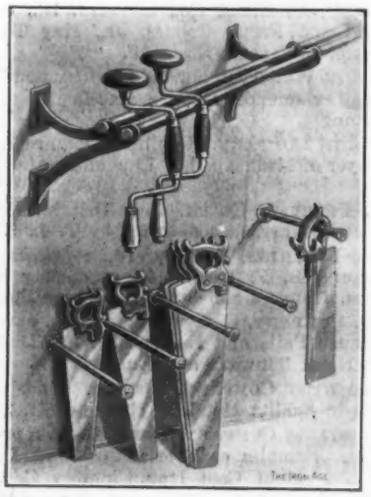


Fig. 59.—Detailed View of Wall Case Fixtures.

equally well, and in either case making a satisfactory showing. Planes are kept on shelves above the Braces.

OILERS.

Drawers with partitions of unequal hight, forming compartments of irregular size and shape, devoted to Oilers and Spouts, are shown in Fig. 60. The drawer on

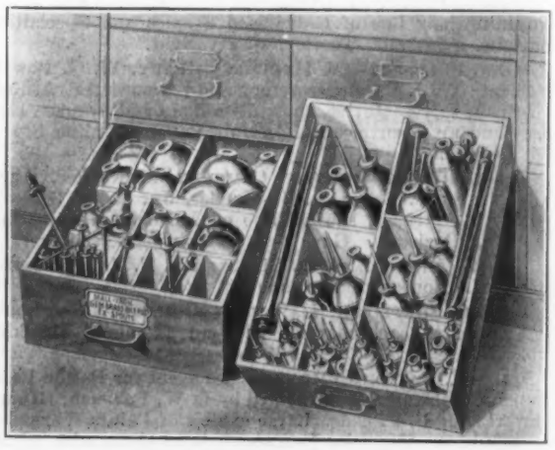


Fig. 60.—Drawers of Oilers.

the left hand side of the illustration contains Malleable Iron and Brass Oilers. In addition to the regular Spouts that come with the Oilers extra long Spouts are carried,

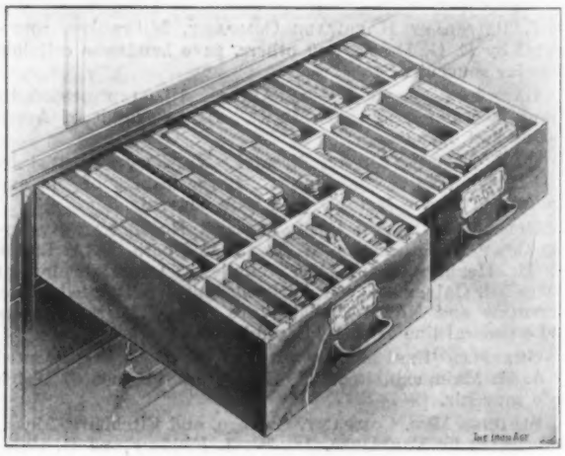


Fig. 61.—Arrangement of Rules.

these standing with the small end down in the front of the drawer. The long Spouts for the Engineer's Oilers in the other drawer are especially provided for in the long

compartment at the side, with a low partition along the inner side.

RULES AND TAPES.

Two of the drawers devoted to Rules are shown in Fig. 61. It will be seen that the width and length of the compartments correspond to the size of each number of Rule, both boxwood and ivory.

Measuring Tapes are provided for as shown in Fig. 62, the compartments being suited to the size of the individual kinds.

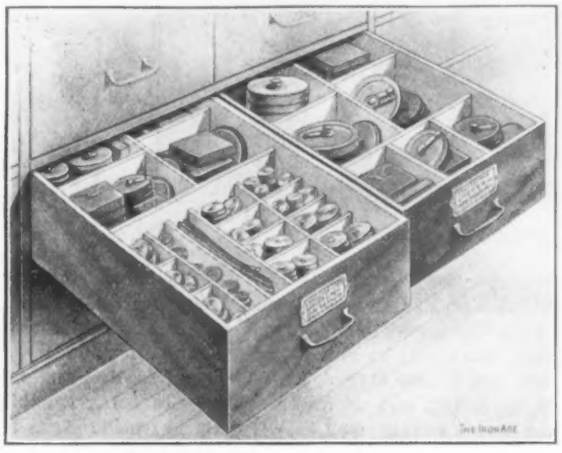


Fig. 62.—Measuring Tapes.

CIRCULAR SAWS.

The illustrations already referred to of the manner of accommodating goods have been chosen as representative ones, indicating the methods pursued in other lines in this department. The manner of keeping Circular Saws is shown in Fig. 63. The interior arrangement

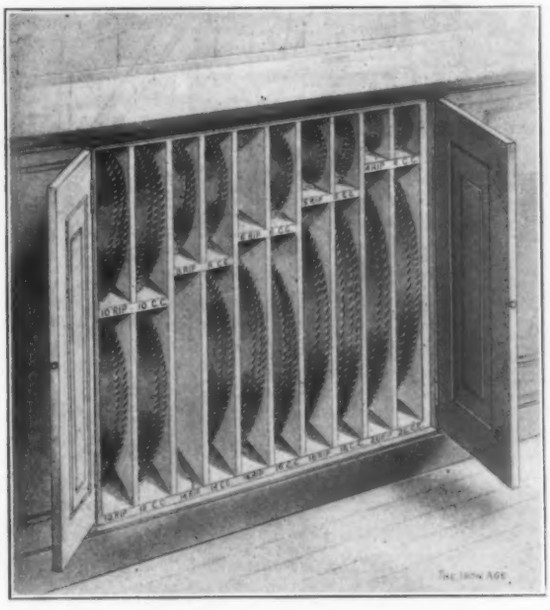


Fig. 63.—Circular Saws.

of the case was built separately and put in place, consequently can be taken out at any time. Saws are kept up to and including 20 inches in diameter, with separate bins for Cross Cut and Rip Saws. The two kinds of Saws of the same diameter are, however, in compartments side by side.

VISES, ANVILS, &C.

The Vise rack shown in Fig. 64 is located near the stairway (Fig. 2), and displays Parallel, Pipe and Saw Vises, Anvils, Miter Boxes, Wood Hand Screws, &c. The sizes of Vises are marked on labels on the edge of the shelves immediately below the goods. The construction and appearance of the rack and the care bestowed upon the orderly arrangement of the goods are in keeping with the entire floor, which is as artistic and

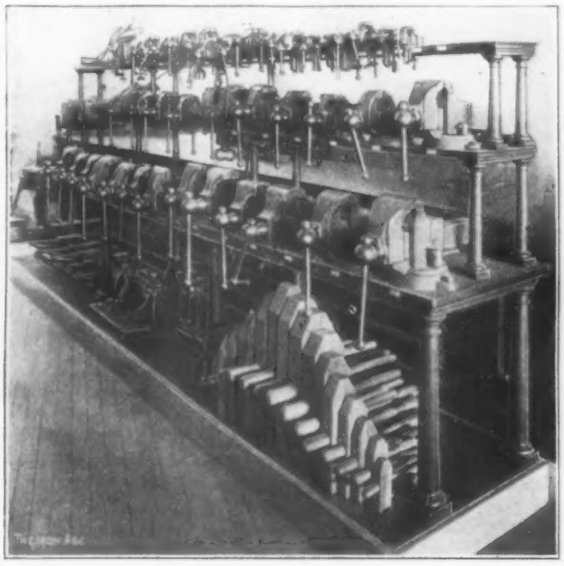


Fig. 64.—Vise Rack.

cleanly as a well arranged and well conducted jewelry establishment.

POCKET CUTLERY.

Pocket Cutlery is kept in a showcase, sampled in trays, as shown in Fig. 65, the trays being 4 x 12 inches in size and ½ inch deep, the bottoms covered with red felt. There are 12 of these trays, which hold 240 patterns of Knives. The assortment includes American, English and German makes, with one, two, three and four blades, in cocobola, stag and pearl handles, Knives with the same number of blades and the same kind of handles

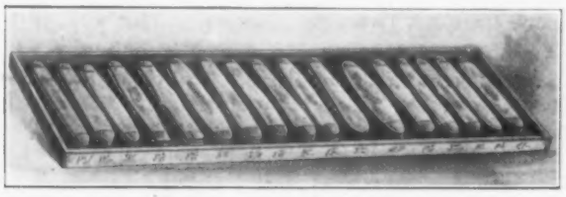


Fig. 65.—Pocket Cutlery Tray.

being given a separate tray. Thus in one tray are Knives with four blades, pearl handled, and in another four blades, stag handled. The number of each Knife is marked opposite the location of the Knife in the tray, on a celluloid covered card board strip attached to the outside of the tray, this insuring Knives being kept in the same order. The number and price of each Knife are marked on the blade with ink, which is easily scraped off without leaving any mark. The arrangement of trays permits all patterns of Knives of any particular make having the number of blades and kind of handle desired by a customer to be placed before him in one tray. The stock of Knives is kept in drawers with wood and metal partitions underneath the counter.

Manual Training Department.

An extensive business is done in supplying manual training schools, and a room is devoted to this department, shown in Fig. 66, its location being designated in Fig. 2. The line includes wood bench work, wood turning, metal bench work, metal machine work and blacksmithing. Samples of the Tools are contained in showcases and in drawers under the cases. Tool Cabinets for boys and combination Cabinet and Bench for men are also sampled in this department. The Boys Cabi-

nets are fitted up with the same kinds of Tools, in different assortments, as are supplied to manual training

Fig. 66.—Manual Training Room.

schools. The boy accompanied by his father recognizes this fact, which is a great aid in making sales.

(*To be continued.*)

MISCELLANEOUS NOTES.

The Stover Mfg. Company.

The Stover Mfg. Company, Freeport, Ill., is making a new janitor mop in both copper and tinned finish, and is furnishing its line of lamp brackets in oxidized copper as well as in bronze finish. Additions have been made to the line of hard wood lemon squeezers, also extension mop, broom and duster handles. The company now has a very complete line of stove cover lifters and stove pokers.

General Purpose Wrenches.

The Page-Storms Drop Forge Company, Springfield, Mass., has added a line of general purpose wrenches, known as the company's No. 300, in five sizes, from 6 to 10 inches. The company is installing three new drop hammers, purchased from the Billings & Spencer Company, Hartford, Conn.

Steel Handle Monkey Wrenches.

The Bemis & Call Hardware & Tool Company, Springfield, Mass., has added three sizes to its line of steel handle monkey wrenches, 6, 21 and 24 inch. The 21 and 24 inch sizes are entirely new in the trade, it is stated.

Tool Makers' Vises.

The Hopkinson Machine Works, Springfield, Mass., have added a larger size to their line of tool makers' vises. It is known as the No. 2, and has a width of jaw of 7½ inches and depth of jaw 2 7-16 inches. The jaw opens 9 inches and the weight is 80 pounds. The vise is essentially the same as the two smaller sizes previously manufactured.

Chasse Wood Mouse Trap.

In illustrating and describing the Chasse wood mouse trap, both one hole and three holes, in *The Iron Age* of February 2, made by the Chasse Mfg. Company, the address was incorrectly given as Middletown, Conn. It should have been Middletown, N. Y., where any correspondence for the company should be sent. The traps have several novel features for both easily baiting and setting. Frederic Klages, 127 Duane street, New York, is the sales agent for this line of traps.

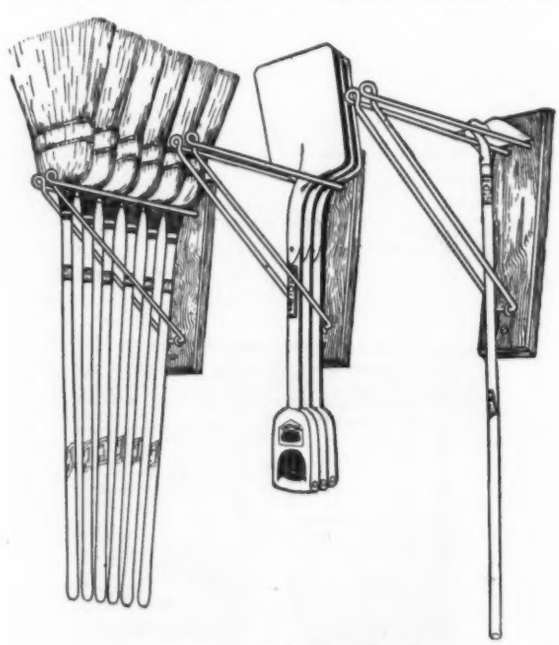
Electrician's Bit.

C. E. Jennings & Co., 42 Murray street, New York, have just added to the extensive line of auger bits and other boring tools made by them a bit especially for electricians, as here illustrated. It is made in 11-16-inch diameter for ⅝-inch bushings for insulating work, has 6-inch shank and is 11 inches long over all, which obviates the necessity for putting on an extension for ordinary work. It is single twist, with extension lip and spur and coarse thread, making it self feeding and rapid in operation, one of its characteristics being capability for boring equally well in soft or hard woods. It is tempered through, oil tempered and numbered 1½C.

Special Bit for Electricians.

Danhour's Patent Tool Rack.

The accompanying cuts show the use to which the three sizes of wire brackets can be put in the store, house-



Danhour's Patent Tool Rack.

hold and on the farm. The brackets are made of heavy coppered wire, sustaining 200 pounds or more. They are supplied with strong wooden backs, varnished and bored for nails, screws or hook. The point is made that the brackets are designed to hold tool handles in line. No. 1, 14-inch brackets, are for store; No. 2, 10-inch, for farm, and No. 3, 5-inch, for house use. The brackets may be used to hold scoops, shovels, spades, forks, hoes, rakes, mops and brooms, and are put on the market by the Tucker & Dorsey Mfg. Company, Indianapolis, Ind.

Crystal Food Holder.

The Ware-Standard Mfg. Company, 50 Warren street, New York, is manufacturing the Crystal food holder, shown herewith. The strong glass jar is in sizes 1, 2 and 3, respectively 10, 12 and 14 inches high and capable of holding, for example, 3½, 7 and 14 pounds of granulated sugar, in the order named. It is designed for such

Fig. 1.—Crystal Food Holder Suspended Under Shelf.

materials as sugar, coffee, salt, rice, &c. The jar's contents are protected from air, moisture and dirt by means of a detachable glass cone fitted with a removable horizontal valve, which is held rigidly to the jar by a fruit jar ring, both of which are of zinc to prevent corrosion and used in connection with rubber gaskets inside and outside. The clamping ring is nickeled and polished to give a fine finish. In use the jars can be suspended

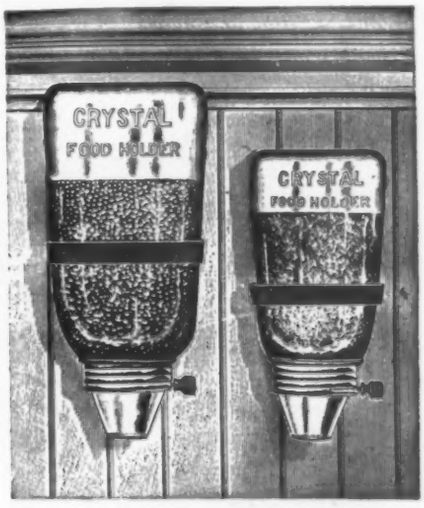


Fig. 2.—Holders Attached to Wall.

from the under side of shelves in a closet or screwed against a vertical wall anywhere, iron clamps aluminized being furnished in either style as ordered. at a uniform price. After filling the jar is inverted and placed in the bracket, so that the contents can be drawn at will in any quantity, the extreme delivering capacity equaling about one-half of the neck space, a push of a projecting arm opening or closing the valve up to a quarter turn, which uncovers an opening on two sides of the pivoted center. What is accomplished by this construction is the protection of food materials from various contaminating influences, at the same time by means of the air tight joints retaining the natural properties of the various substances unimpaired for reasonable periods, according to their character, and enabling the individual to determine instantly both the article contained and quantity remaining. As the joints are air tight and the contents resting on the valve disks serve as a seal, such ingredients as salt, sugar, &c., are said by the company not to cake or become lumpy; coffee in bean or ground retains its aroma, and substances of any kind subject to deterioration are better kept in a healthful and sanitary condition and easily reached. Various vessels, such as sugar bowls, salt cellars, kitchen utensils, &c., can be quickly filled without exposing the remainder.

Hammocks with New Style Valances.

In the accompanying cuts are shown new features in hammock valances introduced by I. E. Palmer, Middletown, Conn. The valance across the head end, shown

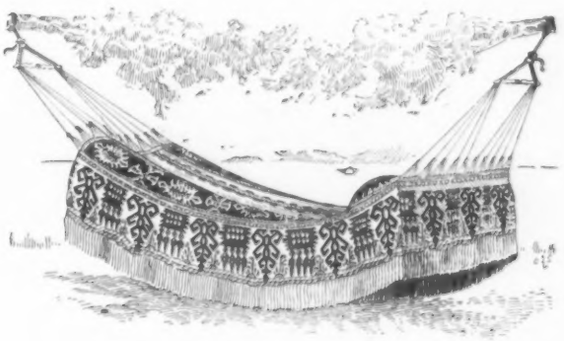


Fig. 1.—Wide Valances on Sides and Head of Hammock.

in Fig. 1, gives a finished appearance to the hammock. The draped valance, illustrated in Fig. 2, makes a handsome and attractive hammock. This style of construction is made in all of the manufacturer's lines. Twenty-two medals and awards have been granted to the Palmer lines

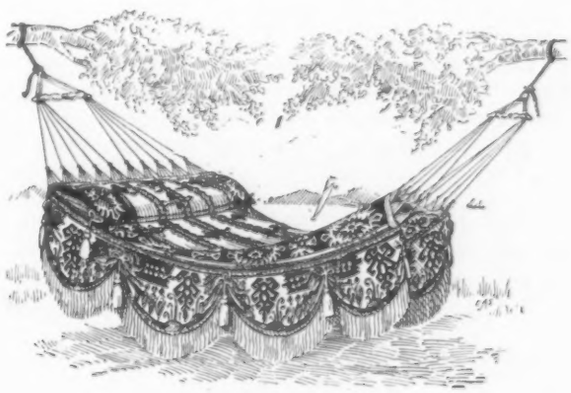


Fig. 2.—Hammock with Wide Draped Valance and Upholstered Pillow.

at national and international exhibitions since 1863, including the Louisiana Purchase Exposition. The Palmer patterns and colorings exceed those of last year for beauty and design, among which are a large number of light and fancy shades of colorings.

Wm. W. Woodward, Newton, N. J., who has conducted a large Hardware and Implement business at that point for the past 40 years, has just filed with the Secretary of State at Trenton a certificate incorporating the Wm. W. Woodward Hardware Company with an authorized capital of $90,000. The stockholders are all members of his immediate family and took over the business so long managed by Mr. Woodward on the 1st inst.

Clapboard Marker No. 340.

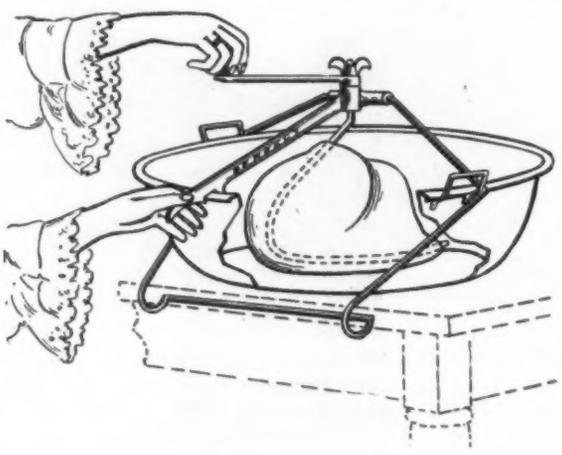
The marking cutters of the clapboard marker illustrated herewith are parallel with the guides when placed against the corner board or window casing, the cutters being beveled on one side only to insure an accurate mark-

Clapboard Marker No. 340.

ing and a close joint. The marker can be operated for either right or left hand, and automatically accommodates itself to various thicknesses of clapboards. The metal parts of the tool are finished in white nickel and the hard wood handle is well polished. The tool is placed on the market by Goodell-Pratt Company, Greenfield, Mass.

Perfect Bread Maker.

The R. W. Jamieson Company, 50 Warren street, New York, has just put on the market the Perfect bread maker, here illustrated, a portion of the pan, which is



The Perfect Bread Maker.

furnished with the mixing mechanism, being cut away to show the method of operation. The dotted lines indicate the curved mixing rod imbedded in the mass of dough. The tin pan has a dough capacity of about eight loaves. The mixing pan is kept in a permanent position on a table or shelf during the mixing and kneading processes by the hooked frame made of steel rod, which can be easily and quickly adjusted to table or ledge, whether ½ inch or 2 inches thick, it being necessary only to press down lightly upon the end of the lever, there being no thumb screws or other parts to mar the wood work. The mixing rod is mounted on the frame in such a way as to allow of its being tilted out of the pan, so that the dough after kneading can be stripped from the rod by merely putting a little flour on the finger and pushing the mass off, or a knife can be used without soiling the hand. At the same time the pan can be withdrawn from the frame and the mixture allowed to rise in the pan in which it is mixed. The mixer can be easily adjusted and as quickly removed for cleansing. In operation the mixing rod picks up the dough, which from its soft, spongy character tends to lag and travel slower than the mixing rod which draws through it, thus reaching in the operation eventually every part of the mass and distributing evenly and mechanically the leavening yeast and other ingredients with the least amount of time and labor. This device is an improved form of the company's Easy dough mixer, which was illustrated in these columns several months ago for use with such pan or receptacle as the housekeeper possessed and which the company still manufactures.

Ideal Refrigerator Spring Hinge and Lock.

The Stover Mfg. Company, Freeport, Ill., is placing on the market a line of ornamented refrigerator hinges and locks, as illustrated herewith. The design is new and artistic. The special feature of the hinge is that it is

Fig. 1.—Ideal Refrigerator Hold Back Spring Hinge.

a hold back spring hinge, which is a new departure in this class of goods. The bearing parts all work on steel pins to render it an easy working and long lived hinge. The hinge and lock are ornamental cast brass, matte finish.

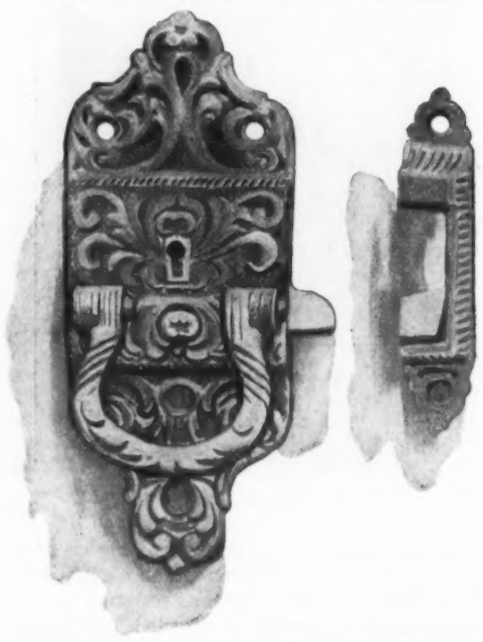


Fig. 2.—Ideal Refrigerator Lock.

The hinges are packed ½ dozen pairs in a box, with screws, and the locks 1 dozen in a box, with screws, both being put up ½ gross in a case.

The Kennedy Magazine Tack Hammer.

Kennedy Mfg. Company, North Easton, Mass., is placing on the market the magazine tack hammer shown in the accompanying illustrations. A metallic loader, not illustrated, is provided to load the tacks in the handle, as they appear in the sectional cut, Fig. 2. In operation the

Fig. 1.—The Kennedy Magazine Tack Hammer.

hammer is held in a level position, and the rod is pushed with the thumb as far as it will go, as in Fig. 3. The lower end of the hammer head is a strong magnet, which automatically takes the tack given out from the tack magazine inside the handle and presents it ready for hammering, when the thumb is removed from the push rod, as in Fig. 1. The magnetism will last indefinitely if the keeper provided is kept on the face of the hammer when it is not in use. If the keeper is lost any piece of iron or steel about the same size will answer the purpose. The tack can be driven by one or more blows into the hardest of wood without fear of hurting the hammer. The magazine holds 60 or more common tacks, the tacks and hammer being together ready for instant use. The hammer obviates the necessity of holding tacks in the fingers or mouth, and allows the holding of the article with one hand while using the hammer with the other. The manufacturer states that one can drive tacks from

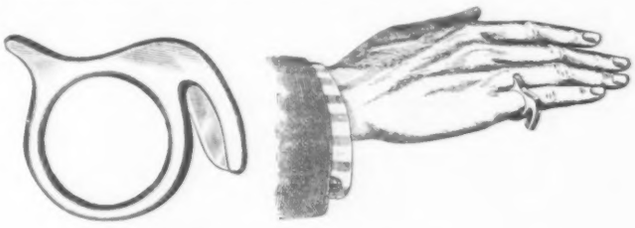
Fig. 3.—Magnet Taking the Tack.

three to four times as fast as with an ordinary hammer. The device is designed for the use of carpet layers, decorators, window dressers, bill posters and for general home use.

Fig. 2.—Sectional View of Kennedy Magazine Tack Hammer.

The Magic Twine Cutter.

A handy little article which serves a useful purpose in a wide range of work is the twine cutter shown herewith, offered by F. A. Richardson & Co., Dock Square, Boston, Mass. The device is designed for use by manufacturing companies, business houses, salesmen, clerks and operatives of all kinds. The cutter is made in ring form to fit closely on the little finger. It is produced in 12 half sizes, from 5 to 11½, according to the United States standard ring size, so that rings can be selected to fit any fingers. The cutter is operated fitting close to the finger. The ring itself is made of a hard metal casting, polished and silver plated, and it is not in the way or an inconvenience to work at any time. The knife blade is of high quality tool steel, hand ground to a fine edge, and tempered to the right degree, and, it is claimed, will keep a sharp cutting edge for an indefinite length of time. By the use of this device cord, from thin twine up to



The Ring Cutter. As Used.

The Magic Twine Cutter.

heavy marline, can be cut easily, thus obviating the sore fingers which come through snapping twine on parcels. When a package or bundle is tied the end of the twine is caught between the knife edge and the outer surface of the ring proper, and by a slight movement of the hand the twine is instantly cut. By the use of this time and labor saving device an operator is enabled to do up many more packages with less effort and inconvenience. Another merit is that a considerable saving in twine is secured on account of being able to cut it close to the bundle. Where large numbers of bundles are done up this is quite an item of expense.

Schofield's Economy Oven.

Schofield & Co., Freeport, Ill., have engaged in the manufacture of the oven which we illustrate. This is intended for use on gas or gasoline stoves. The V shaped heat deflector throws the heat to each side and up to the top of the oven, making a perfectly balanced heat and insuring large efficiency. The oven weighs 8 pounds and

Schofield's Economy Oven.

its makers claim that it will save more than three-quarters the cost of baking over the ordinary gas range oven. The ovens are shipped knocked down and nested, the weight of the dozen ovens packed being about 100 pounds and the space occupied being but little larger than that required for one oven set up. The company contemplates the erection of a factory early this spring to be devoted exclusively to the manufacture of this oven.

Fox's Squares and T Bevel.

The Challenge Cutlery Corporation, Bridgeport, Conn., for which Wiebusch & Hilger, 9-15 Murray street, New York, are sole agents, has put on the market Fox's try and miter squares and sliding T bevel, here shown. The various tools are of the same order of construction, being

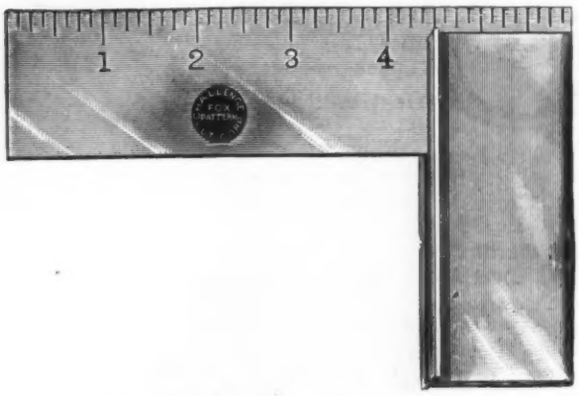


Fig. 1.—Fox's Pressed Steel Try Square.

made on special machinery devised to produce tools absolutely accurate both inside and outside and at moderate prices. They are all made of pressed sheet steel, polished and nickeled. Fig. 1 illustrates the No. 1 try square, made in 3, 4½, 6, 8 and 10 inch sizes. The blade is graduated in eighths of an inch, and the beam or handle is formed of two pieces of pressed steel securely attached to blade. Fig. 2

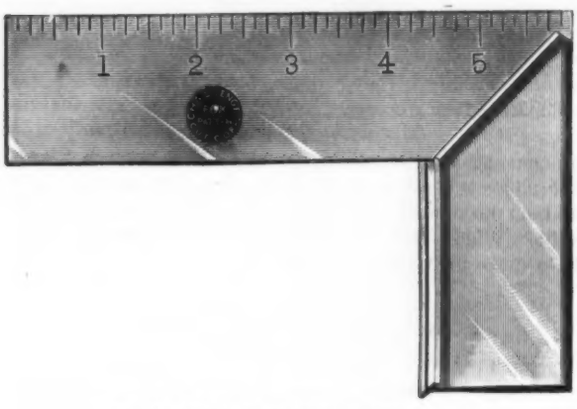


Fig. 2.—Fox's Pressed Steel Miter Square.

represents the line of No. 2 miter square constructed in the same general way in 4½, 6 and 8 inch sizes. Both try and miter squares will be made for the export trade with metric graduations for those requiring that system of measurement. Fig. 3 illustrates Fox's all steel sliding T bevel, made by the same processes, and which the company expects to be able to furnish in the near future. It is now in course of manufacture. This tool is No. 4, and the sizes are 6, 8, 10 and 12 inches. There is a

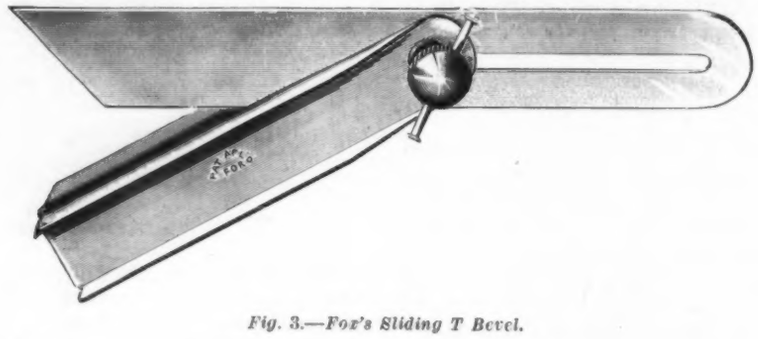


Fig. 3.—Fox's Sliding T Bevel.

movable lever which slides either way, thereby enabling the user to get a good leverage when fastening the screw. The company also makes Fox's combined square and miter No. 3 in the various sizes, which is of the same general construction.

Coffee and Tea Strainers.

The American Mfg. Company, Waterbury, Conn., for which W. A. Lawrence & Co., 10 Warren street, New York, are direct representatives, has put on the market

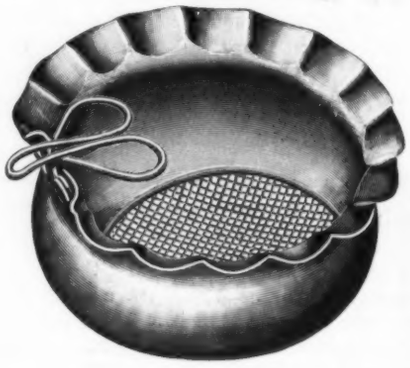


Fig. 1.—Tea and Coffee Strainer, Full Size.

the coffee and tea strainer here shown, Fig. 1 being full size, Figs. 2 and 3 showing the actual application to the differing spouts of coffee and tea pots, respectively. At

Fig. 2.—Attached to Coffee Spout.

the bottom is a fine wire gauze strainer. The curve of the body metal is such that when pouring has ceased there is no drip, as the trifling amount of fluid in strainer re-

Fig. 3.—Attached to Tea Spout.

mains in the depression. The curved wire spring is strongly attached to the body by means of two small eyelets, which pass through the metal and hold the wire ends securely to the side, at the same time strengthening that important part. The strainers are made in both nickel and silver finishes, there being another strainer in a plain shape entirely of wire with the same spout attachment, lower in price.

Weather Proof Iron Box Telephone.

The Connecticut Telephone & Electric Company, Meriden, Conn., is introducing the new type of weather proof iron box telephone shown herewith. The box, which is well constructed throughout, is designed for exchange connection as well as for street railway purposes, also for mine and police systems, and can be arranged for magneto or common battery systems as required. The

Weather Proof Iron Box Telephone.

left hand section contains the hand microphone and lightning arrester. The right hand section contains the batteries, generator, ringer and induction coil, which is also inclosed as a further protection to the parts. In the base is the gong box, in which are mounted 3-inch duplex bells, which are audible for a considerable distance. The instrument is also made up without bells and the hand microphone is also furnished without the switch in the handle, the necessary switch being thrown when the door is opened. In styles 12D and 12C the switch is open when the door is closed, so that there can be no possible chance of a burn out by lightning or high tension currents. This type of telephone is recommended especially for street railway use on account of the great number of telephones which can be placed on one line. The company is also furnishing complete portable telephone sets for street railway use.

Little Giant Ice Crusher.

Davenport Ice Chipping Machine Company, Davenport, Iowa, is offering ice crushing machines, one size of which is shown herewith. The blades are made on the spiral plan, so that the ice is cut, not crushed. The

Little Giant Ice Crusher.

blades are so arranged that just sufficient ice feeds through as the cylinder revolves to cause the machine to run steadily and easily. The ice, being placed directly on top of the cylinder, feeds through of its own weight. After the ice leaves the blades it falls directly through the cylinder, completing the operation. It is pointed out that the steady, easy cutting process relieves the entire machine as well as the cylinder of strain and of all liability of breaking. Power crushers like the one illustrated are made of different sizes for crushing ice for any purpose, either fine or coarse. Two sizes of hand power machines are made, all being constructed of iron. The company also manufactures an ice crusher to attach to the side of ice wagons, which operates by means of a handle on the fly wheel.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	℔
Lead, English white, in Oil	9¼@ 9¾
Lead, American white, in Oil:	
Lots of 500 ℔ or over	@ 6½
Lots less than 500 ℔	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 ℔ tin pails, add to keg price	@ ½
Lead, White, in oil, 12½ ℔ tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 ℔ ass'ted tins, add to keg price	@ 1½

Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	℔
Lead, White, Dry in bbls	@ 6
Zinc, American, dry	4¾@ 4¾
Zinc, French:	
Paris, Red Seal, dry	8½
Paris, Green Seal, dry	9¾
Antwerp, Red Seal, dry	7½
Antwerp, Green Seal, dry	8¾
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	11⅞@12¾
Lots of less than 1 ton	12⅛@12¾
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	10⅝@11¼
Lots of less than 1 ton	10⅞@11¾

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔
Black, Carbon	5 @10
Black, Drop, Amer	4 @ 6
Black, Drop, Eng	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4¼@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.55@4.00
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 ℔ or over	@ 6½
Lots less than 500 ℔	@ 7
Litharge, bbls., ½ bbls. and kegs:	
Lots 500 ℔ or over	@ 6½
Lots less than 500 ℔	@ 7
Ocher, American	℔ ton $8.50@16.00
Orcher, American Golden	2½@ 3½
Orcher, French	1¾@ 2¼
Orcher, Foreign Golden	3 @ 4
Orange Mineral, English	8¾@10½
Orange Mineral, French	10½@11¾
Orange Mineral, German	7¾@10
Orange Mineral, American	8 @ 8¼
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	℔ 100 ℔ $0.50@1.25
Red Venetian, English	100 ℔ $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	℔ ton $20.00@30.00
Talc, American	℔ ton 16.00@25.00
Terra Alba, French	℔ 100 ℔ 90 @1.00
Terra Alba, English	℔ 100 ℔ 90 @1.00
Terra Alba, American, ℔ 100 ℔, No. 1	.60 @70
Terra Alba, American, ℔ 100 ℔, No. 2	.45 @50
Umber, T'key, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1½@ 2
Umber, Raw, Amer	1½@ 2
Yellow, Chrome	11 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@66
Vermilion, English, Import	75 @90
Vermilion, Chinese	$0.90@1.00

Colors in Oil—

	℔
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

Miscellaneous—

Barytes, White, Foreign	℔ ton $17.50@19.00
Barytes, Amer. floated	℔ ton 17.00@18.50
Barytes, Crude, No. 1	℔ ton 10.00@11.00
Chalk, in bulk	℔ ton 3.00@ 3.25
Chalk, in bbls	℔ 100 ℔ @ .35
China Clay, English	℔ ton 11.00@17.00
Cobalt, Oxide	℔ 100 ℔ 2.50@
Whiting, Common	℔ 100 ℔ .45@ .46
Whiting, Gilders	℔ 100 ℔ .55@ .57
Whiting, Ex. Gilders	℔ 100 ℔ .58@ .60

Putty—

	℔ 100 ℔
In bladders	$1.65@1.70
In bulk	1.05@1.15
In cans, 1 ℔ to 5 ℔	2.00@2.90
In cans, 12½ to 50 ℔	1.40@1.55

Spirits Turpentine— ℔ gal.

In Oil bbls	54½@55
In machine bbls	55 @55½

Glue—

	℔ ℔
Cabinet	11 @15
Common Bone	6 @ 8
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	7 @10
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	8 @11
Medium White	14 @17

Gum Shellac—

	℔ ℔
Bleached Commercial	35 @36
Bone Dried	15 @16
Button	45 @60
Diamond I	53 @..
Fine Orange	43 @45
A. C. Garnet	36 @40
D. C	@..
Octagon B	50 @..
T. N	35 @36
V. S. O	53 @..

Animal, Fish and Vegetable Oils— ℔ gal.

Linseed, City, raw	43 @44
Linseed, City, boiled	45 @46
Linseed, State and West'n, Raw	40 @..
Linseed, raw Calcutta seed	@55
Lard, Prime, Winter	56 @58
Lard, Extra No. 1	48 @49
Lard, No. 2	36 @38
Cotton-seed, Crude, f.o.b. mills	16 @17
Cotton-seed, Summer Yellow, Prime	24 @24½
Cotton-seed, Summer Yellow off grades	24 @24¼
Sperm, Crude	60 @..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	62 @64
Sperm, Bleached Winter	65 @67
Tallow, Prime	48 @50
Whale, Crude	@..
Whale, Natural Winter	45 @..
Whale, Bleached Winter	47 @..
Menhaden, Brown, Strained	27 @28
Menhaden, Light, Strained	28 @29
Menhaden, Bleached Winter	30 @32
Menhaden, Ex-Bld, Winter	32 @33
Menhaden, Southern	19½@20
Cocoanut, Ceylon	℔ ℔ 6½@ 6¾
Cocoanut, Cochin	℔ ℔ 7¾@ 7¾
Cod, Domestic, Prime	36 @38
Cod, Newfoundland	39 @41
Red Elaine	31 @33
Red Saponified	℔ ℔ 4¾@ 5
Olive, Italian, bbls	54 @58
Neatsfoot, prime	50 @51
Palm, prime Logos	℔ ℔ 5½@ 5¾

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	10½@11½
Black, 29 gravity, 15 cold test	11½@12½
Black, Summer	10½@11½
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	12½@13
Paraffine, 903 gravity	11½@12
Paraffine, 883 gravity	9¼@ 9½
Pariffine Red	11½@13

In small lots ⅛¢ advance.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils.....℔ lb 7¼@7¾¢
Hay-Budden, Wrought.....9@9¼¢
Horseshoe brand, Wrought.....9@9¼¢
Trenton .....℔ lb 9@9¼¢

Imported—
Peter Wright & Sons.....℔ lb 10½¢

Anvil, Vise and Drill—
Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Hull Bros. Co.....30&10%
Livingston Nail Co.....33⅓%

Augers and Bits—
Com. Double Spur....75@75&10%
Boring Mach. Augers.70&10@75%
Car Bits, 12-in. twist..60@60&10%
Jennings' Pattern..60&10&10@70%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&10&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10@60%
Wright's Jennings' Bits (R. Jennings' list) 50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....50&10%
Ford's, Clark's Pattern.....50&10@60%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 18, $5.75

Hollow Augers—
Bonney Pat., per doz.$9.00@10.00
Ames .....25&10%
New Patent.....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—
Ford's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts— See *Hafts, Awl.*

Awls—
Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63¢@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets— See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights. (up to 3½ lb.)
First Quality.....$6.50
Second Quality.....$6.00
NOTE.—Heavier Weights add Extras as per regular schedule.

Axle Grease— See *Grease, Axle*

Axles— *Iron or Steel*
Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18.....75&10@75&10&5%
Nos. 19 to 22.....75&10@75&10&5%

Boxes, Axle—
Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait— Fishing—
Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—
Caldwell new list.....50%
Pullman .....50&10@60%

Spring—
Spring Balances.....60@60&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire— See *Wire, Barb.*

Bars— Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¼¢

Towel
No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—
Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, No. A, Japanned....℔ doz. $1.20
Holt, No. 1, Tinned.....℔ doz. $1.50
Holt, No. B, Japanned....℔ doz. $2.00
Holt, No. 2, Tinned.....℔ doz. $2.25
Lyon, No. 2, Japanned....℔ doz. $1.25
Lyon, No. 3, Japanned....℔ doz. $1.50
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (S. S. & Co.).℔ gro. net, $6.00

Bellows—
Blacksmith, Standard List.. 60&10@70&10%

Blacksmiths'—
Inch.. 30 32 34 36 38 40
Each.$3.25 3.50 4.00 4.50 5.00 5.75
Extra Length:
Each.$3.75 4.25 4.75 5.25 6.00 7.00

Hand—
Inch... 6 7 8 9 10
Doz...$4.50 5.00 5.50 6.00 6.50

Molders—
Inch. 9 10 11 12 14
Doz.$8.00 9.00 10.50 12.50 14.50

Net Prices.

Bells— Cow—
Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—
Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—
Hand Bells, Polished, Brass.. 60&5@60&10&5%
White Metal.....60%
Nickel Plated....50&10@50&10&5%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—
Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting— Leather—
Extra Hvy, Short Lap.60@60&5%
Regular Short Lap...65&10@70%
Standard .....70&5@70&10%
Light Standard.....70&10@75%
Cut Leather Lacing.....60&10%
Leather Lacing Sides, per sq. ft. 17½@18¢

Rubber—
Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....65&e70%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops— See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—
John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits— Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—
Common Wooden....70&10@75&5%
Hartz St. Tackle Blocks.....50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c...30&10@40&10%

Boards, Wash— See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co.....33⅓%

Bolts— Carriage, Machine, &c.—
Common Carriage (cut thread): ⅜ x 6 and Smaller....75@2½%
Larger and longer 70%
Phila. Eagle,$3.00 list May 21,'99 80&10%
Bolt Ends, list Feb. 14, '95..70&5%
Machine, ⅜ x 4 and smaller 75@5%
Machine, larger and longer.. 70@7½%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:
Inch..... 3 4 5 6 8
Per doz.$0.30 .35 .45 .56 .75
Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz.....$1.15 1.40 2.00
Cast Iron Chain,Flat,Japanned:
Inch..... 6 8 10
Per doz.....$0.95 1.25 1.55
Cast Iron Shutter, Japanned, Brass Knobs:
Inch..... 6 8 10
Per doz.....$0.80 .90 1.00
Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square.66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Stove and Plow—
Plow .....70&10@70&10&5%
Stove .....82½@82½&5%

Tire—
Common 72½%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84..80
Eagle Phila., list Oct. 16, '84....82½
Bay State, list Dec. 28, '99.....72½
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84..80
Eagle Phila., list Oct. 16, '84....82½
Eclipse, list Dec. 28, '99.....72½
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....72½
Norway Phila., list Oct., '84.....80
Upson Nut Co.:
Tire Bolts.....72½

Borers, Tap—
Borers Tap, Ring, with Handle:
Inch..... 1¼ 1½ 1¾ 2
Per doz...$4.80 5.60 6.40 8.00
Inch 2¼ 2½
Per doz.....$6.65 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—
C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection .....℔ doz. $30.00
Schatz 40%

Braces—
Common Ball,American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60&10@65%

Brackets—
Wrought Steel...80&10@80&10&5%
Bradley's Wire Shelf:
Full cases.....80&10&10%
Broken cases.....80&10%
Griffin's Pressed Steel.....80%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—
Price per dozen.

	Quart	12	14
Water, Regular	*1.40*	*1.70*	*1.90*
Water, Heavy	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—
Hoosier.....℔ gro. $36.00

Bull Rings— See *Rings, Bull*

Butts— Brass—
Wrought, list Sept., '96.....30%
Cast Brass, Tiebout's.....50%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5%
Parliament Butts.....70@70&5%

Wrought Steel—
Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....55&10%

Net Prices. Butt Joint Butts

Cages, Bird—
Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb.4¢@4¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt.....4@4¼¢
Gautier, Sharp.....4½@4¾¢
Perkins', Blunt Toe.....₱ lb 3.65¢
Perkins', Sharp Toe.....₱ lb 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
E. L.....per M 40@42¢
G. E.....per M 58@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	*¼*	*5-16*	*⅜*	*7-16*	*½*	*9-16*
7.40	*5.10*	*4.15*	*3.45*	*3.30*	*3.20*	*3.15*
⅝	*¾*	*⅞*	*1 to 1¼ inch.*			
3.10	*3.00*	*2.95*	*2.95 per 100 lb.*			

German Coil.....60&10&10@70%

Halters and Ties—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Cow Ties.....60@60&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring.$23.50
6½—6-2, Str'ght, with ring.$24.50
6½—8-2, Str'ght, with ring.$28.00
6½—10-2, Str'ght, with ring.$32.00

NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.

Trace, Wagon and Fancy Chains.....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10@60&10&5%
Brass.....60&10@60&10&10%
Safety Chain.....75@75&10&5%
Gal. Pump Chain....lb. 5@5¼%
Covert Mfg. Co.:
Breast.....40&2%
Halter.....40&2%
Heel.....40&2%
Rein.....40&2%
Stallion.....40&2%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter....45@50&5%
Niagara Coil and Halter...45@50&5%
Niagara Cow Ties....45&5@50&10&5%
Niagara Wire Dog Chains..45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue....gro. 35@38¢
Carpenters' Red.....gro. 30@33¢
Carpenters' White....gro. 25@28¢
See also Crayons.

Checks, Door—

Bardsley's.....45%
Columbia.....50&10%
Eclipse.....60&10%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List....70&10@75&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60%
C. E. Jennings & Co. Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70
Swan's.....70
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers....40&5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 131, 181..25%
L. & I. J. White, Tanged.....25&5%

Cold—

	lb.
Cold Chisels, good quality	*13@15¢*
Cold Chisels, fair quality	*11@12¢*
Cold Chisels, ordinary	*9@10¢*

Chucks—

Beach Pat., each $8.00.....35&5%
Pratt's Positive Drive.....25%
Empire.....25%
Blacksmiths'.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....50%
Universal.....50%
Combination.....50%
Drill Chucks, New Model.....30%
Drill Chucks, Standard.....40%
Drill Chucks, Skinner Pat., 0, 1, 2..40%
Drill Chucks, Skinner Pat., 3, 4, 5, 6, 7, 8.....30%
Drill Chucks, Positive Drive.....30%
Planer Chucks.....25%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent.....50%
Independent Steel.....40%
Union Drill.....45%
Universal.....50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P. S. & W. Co..50%
Carriage Makers', Sargent's.....60%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓@33⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75 } 15%
1902 Chicago Horse.....10.75 }
20th Century Horse, each, $5.00...20%
Lightning Belt.....$15.00 } 15%
Chicago Belt.....$20.00 }
Stewart's Patent Sheep, $12.75....20%

Finger Nail Clippers—

Smith & Hemenway Co.₱ doz. net $2.00

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....70&10@75%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
A Eastern	*75&5%*	*75%*
B, Eastern	*75&10%*	*75&5%*
Central	*75&5%*	*70&10&5%*
Southern	*70&7½%*	*70&2½%*
S. Western	*70&5%*	*70%*

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galv. Lined, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

25%

Gavl. Lined, side handles.

Gal.	2	3	4	6	8
Each.	$1.35	$2.15	$2.40	$3.30	$4.15

25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided White, Com. lb. 21@22½¢
Cable Laid Italian.....lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..11@11¢
Patent Russia.....lb...@11¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted..lb. 12@13¢
Anniston Cordage Co.: Braided Cotton,
Old Glory, Nos. 7 to 12....₱ lb 28 ¢
Anniston, Nos. 7 to 12....₱ lb 22 ¢
Old Colony, Nos. 7 to 12..₱ lb 22 ¢
Anniston Drab, Nos. 7 to 12, ₱ lb 26 ¢
Pearl Braided, cotton, No. 6, ₱ lb, 22½¢; No. 7, 21½¢; Nos. 8 to 12, 21¢
Eddystone Braided, Nos. 7, 8, 9 and 10.....₱ lb 24 ¢
Eddystone Braided Cotton, No. 6..₱ lb 25 ¢
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Peerless:
Cable Laid Italian.....16 ¢
Cable Laid Russian.....14 ¢
Cable Laid India.....12 ¢
Braided India.....18 ¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....₱ lb 40 ¢
Braided, Italian Hamp....₱ lb 40 ¢
Braided, Linen.....₱ lb 55 ¢
Braided, White Cotton or Spot....₱ lb 35 ¢
Massachusetts, White.....₱ lb 28 ¢
Massachusetts, Drab.....₱ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab.....40 ¢
A quality, White.....35 ¢
B quality, Drab.....35 ¢
B quality, White.....30 ¢
Italian Hemp.....40 ¢
Linen.....57½ ¢

Wire, Picture—

List Oct., '00.....
85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, gr. 5½@16¢
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.:
Jumbo Crayons.....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
(Case lots, 20%)
Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black.....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co.....40%
Red Devil.....50
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's.....₱ doz. 30&10@40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10@50%
Little Giant.....₱ doz. 33⅓@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....40%
New Triumph No. 605, ₱ doz. $24.00..
30&10@40%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....₱ doz. 30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$36

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise.....25&@30%
National, ₱ doz., No. 1, $21; No. 2, $18.....40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's, Nos. 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers.....₱ doz. $6.25
Iwan's Perfection Post Hole Digger..₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers.....₱ doz. $7.25
Kohler's Universal.....₱ doz. $15.00
Kohler's Little Giant.....₱ doz. $12.00
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.00
Kohler's Pioneer.....₱ doz. $7.20
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, 7/8 in....₱ doz. $10.50
Phillips', style 077, 7/8 in....₱ doz. $8.00
Phillips', style x-y, 7/8 in....₱ doz. $11.00

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P. S. & W.....40&5%
Goodell Automatic Drills..40&5@10&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....33⅓%
Ratchet, Whitney's, P. S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10@60&10&10%
Taper and Straight Shank.....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9.....40%
Buck Bros.' Screw Driver Bits.....30
Champion.....50%
Edson.....60
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Never Turn.....60%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles..60@60&10&10%
No. 86.....70@70&10&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
A, Eastern	*80&7½%*
B, Eastern	*80&12½%*
Central	*80&7½%*
Southern	*70&20&10%*
S. Western	*75&12½%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments:
Plate Rd., and Rd., Cor., 2, 3 and 4 in.....75%
Plate Rd., and Rd., Cor., 5 and 6 in.....60%
Perfect Elbows (S., S. & Co.).....40%

Emery, Turkish—

	4 to 6	*5½ to 180*	*Flour*
Kegs.....lb.	*5 ¢*	*5½¢*	*3½¢*
½ Kegs.....lb.	*5½¢*	*5¾¢*	*3¾¢*
¼ Kegs.....lb.	*5½¢*	*6 ¢*	*4 ¢*
10-lb. cans, 10 in case.....	*6½¢*	*7 ¢*	*6 ¢*
10-lb. cans, less than 10.....	*10 ¢*	*10 ¢*	*8 ¢*
Less quantity..	*10 ¢*	*10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....45%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103.....$4.00
Special, No. 104.....$4.00
Fusible Links.....$0.25
Expansion Bolts.....50&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*	*24*
Per doz	*$2.15*	*2.85*	*3.25*	*3.75*	*4.50*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....70%
Stowell's Giant Grindstone Hanger..℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures, Light.....60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern.80&10@80&10&5%

Gauges—

Marking, Mortise, &c......50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....20@20&10&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....30&10%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush..25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's)...40&10%

Grease, Axle—

Common Grade....*gro. $4.50@5.50*
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00
Pike Mower and Tool Grinder, each.....$6.00
33⅓%
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.25

Halters and Ties—

Covert Mfg. Co.:
Web.....45%
Jute Rope.....50&5%
Sisal Rope.....35&5%
Cotton Rope.....45&2%
Hemp Rope.....45&2%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.70%
Sisal Rope Ties.....60&10%

Hammers—

Handled Hammers—

Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40@40&10&10%
Peck, Stow & Wilcox.....40&10&5%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7½@33⅓&10&7½%
Engineers' and R. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢.....80&10&10@85%
3 to 5 lb., per lb. 40¢.....80&10&10@85%
Over 5 lb., per lb 30¢..85@85&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c.....60&5@60&10&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted...*gro. $2.50@$2.85*
Brad Awl.....*gro. $1.65@$1.85*
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....*$2.40@$2.65*
Hickory Tanged Firmer, gro. assorted.....*$2.15@$2.40*
Apple Socket Firmer, gro. assorted.....*$1.75@$1.95*
Hickory Socket Firmer, gro. assorted.....*$1.45@$1.60*
Hickory Socket Framing, gro. assorted.....*$1.60@$1.75*
File, assorted....gro. *$1.30@$1.40*
*Hammer, Hatchet, Axe, &c.*60&10@60&10&10%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle...℔ gro. $0.85@$1.50

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	*$0.90*	*1.25*	*1.60*	*1.95*	*2.50*

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	*$1.30*	*1.85*	*2.50*	*3.00*

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.60
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10&5%
Roller Bearing.....70&5%
Griffin Mfg. Co.:
Solid Axle, No. 19, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.60&10&2½%
Hinged.....net $6.40
Covered.....60&10%
Special.....70&5%
Lawrence Bros.:
Advance.....60&10%
Cleveland.....70&5%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.....60%
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
Peerless.....70&5%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.15
Ball B'r'g St'l Track No. 10.$2.40
Roller B'r'g St'l Track No. 12.$2.30
Ball B'r'g St'l Track No. 13.$2.40
Roller B'r'g St'l Track No. 14.$2.30
Hero, Adj. Track No. 19.....50%
Adjustable Track Tandem Trolley Track No. 16.....50%
Seal, Steel Track No. 8.....$2.40
Auto Adj. Track No. 22..40&10%
Trolley B. D. No. 17.....$1.40
Trolley F. D. No. 120.....$2.35
Trolley F. D. No. 121.....$2.45
Trolley F. D. No. 150.....$2.60
Safety Underwriters F. D. No. 101.....$2.25
Tandem No. 44.....70&5%
Trolley F. D. No. 151.....$3.00
Palace, Adjustable Track No. 132.....40&10%
Royal, Adjustable Track No. 122.....40&10%
Ives' Wood Track No. 1.....$2.15
Trolley B. D. No. 20.....$1.35
Trolley B. D. No. 24.....$1.45
Trolley B. D. No. 27.....$1.50
Trolley B. D. No. 28.....$1.66
Roller Bearings Nos. 39, 40, 41, 43, 44.....70&5%
Anti-friction No. 42.....60&10%
Hinged Tandem No. 48.....60%
Folding Door B. B. Swivel No. 135.....30%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle.....70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot.....60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing...60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet.....50%
Wilcox Auditorium Ball B'r'g.20%
Wilcox Barn Trolley No. 123..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door, No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%
For Track, see Rail.

Extra 5&10% often given.

Hangers— Garment—

Pullman Trouser, No. 1....℔ gro. $9.00
Pullman Trouser, No. 4....℔ gro. $24.00
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—

Myers' Patent Gate Hangers, ℔ doz. net.....$4.50

Hasps—

McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—

Regular list, first quality.40&2½%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70@75%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 5, 11 and 13..75%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55.....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5...75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'es	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....*doz.*...@*$2.00*
Without Latch..*doz.*...@*$1.60*
Reversible Self-Closing:
With Latch.....*doz.*...@*$1.75*
Without Latch...*doz.*...@*$1.35*
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—

Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—

Holdback Cast Iron.....*gro. $9.00@$9.50*
Non-Holdback, Cast Iron.....*gro. $8.00@$8.50*
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.50
Oxford, new list.....30%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....$9.00
Chief Ball B'r'g Floor Hinge.50%
Ohio Detachable Screen Door Hinge.....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k.℔ gro. pr.$9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges...70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's..70&10%
Hinge Hasps.....50%
Cor. Heavy Strap...75&5%
Cor. Ex. Heavy T..70&10%
} Extra 10@10&5%

Screw Hook and Strap.
6 to 12 in..lb. 3½¢
1½ to 20 in..lb. 3¼¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6 ¢
⅝ inch.....lb. 7 ¢
½ inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....35%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 66⅔%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe..₱ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....₱ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ₱ doz.$4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Empire.....50%
Bardsley's.....45%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Hooks—Cast Iron—

Bird Cage, Reading.....60%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List.....50&10&10%
Clothes Line, Reading List.....60&10%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....66⅔%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....*80&10@..%*
Wire C. & H. Hooks.....
75&10@75&10&5%
Atlas, Coat and Hat:
Single Cases.....75%
10 Case Lots.....75&10%
Columbian Hdw. Co., Gem.....60&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....70&10%
Czar.....65%
V Brace.....70&10%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz $1.50
Grass, common grades, all sizes, per doz.....*$1.30*
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....*60&10&5@60&10&10%*
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horse.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Standard.....*ft. 8 @ 9 ¢*
4-ply Standard.....*ft. 10 @11 ¢*
3-ply extra.....*ft. 11 @13 ¢*
4-ply extra.....*ft. 14 @16 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—

From 4 to 10.....*lb. 2¾@3 ¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Chinese Laundry.....*lb. 4¾@5 ¢*
Chinese Sad.....*lb. 4 @4¼¢*
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*62*	*59*	*72*	*69*
Tin'd Tops	*65*	*62*	*75*	*72*

New England Pressing..lb. 3¾@4¼¢

Pinking—

Pinking Irons.....*doz. 50@60¢*

Soldering—

Soldering Coppers, 2½ & 3..21@21¢
1½ & 2.....*22@21¢*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&5%
Steel.....45&2%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&5%
Richards' Tiger Steel, No. 130.....40%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*70&10@75&10%*
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....70&10&2½%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge..per doz..$5.25@5.50
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Mincing—

Buffalo.....₱ gro. $13.00

Miscellaneous—

Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....*gro.$1.15@1.20*
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....40%
Climax Shelf, No. 113.....40%
Trolley, No. 109.....40%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns— Tubular—

Regular Tubular, No. 0.....
doz. $4.35@4.75
Lift Tubular, No. 0..doz. $4.75@5.25
Hinge Tubular, No. 0.....
doz. $4.75@5.25
Other Styles.....*40&10@40&10&5%*

Bull's Eye Police—

No. 1, 2¾-inch.....*$2.50@2.75*
No. 2, 3-inch.....*$2.75@3.00*

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Richards' Bull Dog, Heavy No. 125.40%
Richards' Trump, No. 127.....50%

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.....35%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet.....	*$2.20*	*2.00*	*1.65*
75 feet.....	*$1.80*	*1.70*	*1.30*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ₱ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks...*33⅓@33⅓&7½%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....45&20%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....50%

Padlocks—

Wrought Iron....*75&10&5@80&5%*
R. & E. Mfg. Co. Wrought Steel and Brass.....75@75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....60%

Machines—Boring—

Com. Upr't, without Augers..$2.00
Com. Ang'l'r, without Augers.$2.25
Without Augers.

R. & E. Mfg. Co.: Upright.	Angular.
Improved No. 3..$4.25	No. 1..$5.00
Improved No. 4.. 3.75	No. 2.. 3.38
Improved No. 5.. 2.75	
Jennings', Nos. 1 and 4.....35&5%	
Millers' Falls..... 5.75	
Snell's, Rice's Pat. 2.50	2.75

Corking—

Reisinger Invincible Hand Power.....
₱ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.: Per doz.
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$26.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$29.00

Mallets—

Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.).....10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National List Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheap.....*all sizes, $1.75@2.00*
Good.....*all sizes, $2.25@2.50*

	10	*12*	*14*	*16-in.*
High Grade..	*4.25*	*4.50*	*4.75*	*5.00*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Philadelphia:
Styles M, S, C, K, T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsters' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5
Champlain	28	26	25	24	25	50
Coleman	13	12	12	11	11	.....net
New Haven..	23	21	20	19	18	...40&5
Putnam	23	21	20	19	18	....33⅓
New Putnam.	19	18	17	16	16	..10&10
Western						.....₱ lb 8½¢

Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*..gro*
Por. Head.	*..1.10*	*1.10*	*1.10*		*..gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, plain.....*$4.90*
Hexagon, plain.....*$5.50*
Square, C. T. & R.....*$5.10*
Hexagon, C. T. & R.....*$5.80*
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....*$5.50*
Hexagon, Blank.....*$5.80*
Square, Tapped.....*$5.50*
Hexagon, Tapped.....*$5.80*

Oakum—

Best or Government.....*lb. 6½¢*
Navy.....*lb. 5 ¢*
U. S. Navy.....*lb. 6 ¢*
Plumbers' Spun Oakum.....*2½¢*
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Chase or Paragon:
Brass and Copper...*45&10@50%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Imp'ed, No. 1, $3.60; No. 2, $4; No. 3, $4.40, ₱ doz. 2%
Malleable, Hammers' Old Pattern, same list.....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

Per doz.
Sprague, Iron Handle.....*30@35¢*
Sprague, Wood Handle.....*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
National.....50%
Stowell's Sprague.....₱ doz. 35@45¢

Egg—

Nickel Plate.....₱ doz., $2.00
Silver Plate.....₱ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope.....*lb. 14@16¢*

Rubber—

(Fair quality goods.)
Sheet, C. I.....*80@10¢*
Sheet, C. O. S.....*90@13¢*
Sheet, C. B. S.....*100@11¢*
Sheet, Pure Gum.....*50@65¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₱ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ₱ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

	1	*2*	*3*	*4*	*5*
Nos.					
Per doz..	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

	12	*14*	*16*	*18*
Inch				
Per doz.....	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co., ₱ doz., Nos. 5, $4.50; 10, $ 25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	40	50	60	110	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	*lb.*
Building Felt.....	*2¾¢*
Mill Board, sheet, 40x40 in.	*3½¢*
Mill Board, roll, thicker than 1-16 inch.....	*3½¢*
Mill Board, 1-16 inch thick and less.....	*2½¢*
	Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll	*35@40¢*
Medium weight, 30 lbs. to roll,	*40@45¢*
Heavy weight, 40 lbs. to roll..	*56@60¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.	
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$38.00@40.00*	
Red Rope Roofing, 250 sq. ft. per roll.....	*$1.75*

Tarred Paper—

1 ply (roll 300 sq. ft.), ton....
$32.50@35.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢
Slater's Felt (roll 500 sq. ft.) .75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.75

Sand and Emery—

Flint Paper and Cloth .60@60&10%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h .50&10@60%

Parers— Apple—

Advance .....℔ doz. $4.00
Baldwin .....℔ doz. $4.00
Bonanza Improved.....each $6.50
Daisy .....℔ doz. $4.00
Dandy .....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
Little Star.....℔ doz. $5.00
New Lightning.....℔ doz. $7.00
Reading 72.....℔ doz. $3.25
Reading 78.....℔ doz. $6.25
Rocking Table.....℔ doz. $6.20
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00

Potato—

Saratoga .....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—

List Feb. 23, 1899.....70&65@75%
Cronk's Handled Garden Mattock, ℔ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in.....60%
Extra Heavy, 2-6 in.....70%
Fittings 75%

Pipe, Merchant—

Carload Lots.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
⅛ & ¼ in..	*68%*	*52%*	*66 ⅔%*	*50%*
⅜ & ½ in..	*72½%*	*60%*	*70%*	*58%*
¾ to 6 in..	*76%*	*66%*	*74½%*	*64½%*
7 to 12 in..	*71%*	*56%*	*69½%*	*54%*

Pipe, Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....71%
New York and New Jersey..74½%
Maryland, Delaware, E. Pa..78%
West, Pa. and West Va...80%
Virginia 76%
Ohio, Michigan and Ky....80%
Indiana 80%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....40&10%
Bench, Second qual.....50&10%
Molding .....33⅓&10%
Bailey's (Stanley R. & L. Co.)..... 5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.)..... 25&10@25&10&10%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....20&10@20&10&10%
Ohio Tool Co.'s Iron Planes.....60%
Sargent's .....60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons..... 25&10@30%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co..20&10@20&10&10%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....℔ doz. $8.50

Plates—

Felloe .....lb. 3¾@4¼¢
Self-Sealing Pie Plates (S., S. & Co.). ℔ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers.....75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers.....50@50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's 60%
Improved Button.....60&10%
Stub's Pattern.....50%
Combination and others.....33¼%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers .....30@30&10%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.: Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable .....10&7½%
Stanley R. & L. Co..30&10@30&10&10%
Stanley's Duplex.....20@20&10&10%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers,lb.8½@9 ¢
½-lb. papers.....lb.9 @9½¢
¼-lb. papers.....lb.9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye.....℔ doz. $3.25
Ft. Madison Western.....℔ doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.). ℔ doz., $3.00; No. 2 (1 qu.), $9.72....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans. ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can...each, $0.65
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside .....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese .....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....℔ doz. $1.00
Black Silk, 5 oz. box.....℔ doz. $0.75
Black Silk, ½ pt. liq.....℔ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. $11.00
2 qt., Square.....gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft. 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller.....$21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00.....33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Pelican, ℔ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots..... ℔ doz. $6.00
Diamond B, No. 3, case lots..... ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15.....40%

Pulleys, Single Wheel—

Inch	*2*	*2½*	*3*
Awning, doz.	*$0.55*	*.85*	*1.15*
Hay Fork, Swivel or Solid Eye.			
doz., ½ in., $1.15; 5 in., $1.45			
Inch	*2*	*2½*	*2½*
Hot House, doz.	*$0.70*	*.90*	*1.25*
Inch	*1¼*	*1½*	*1¾*
Screw, doz.	*$0.16*	*.19*	*.23*
Inch	*1¾*	*2*	*2¼*
Side, doz.	*$0.30*	*.40*	*.55*
Inch	*1½*	*1¾*	*2*
Tackle, doz.	*$0.30*	*.42*	*.58*
Stowell's:			
Ceiling or End, Anti-Friction			.60&10%
Dumb Waiter, Anti-Friction			.60&10%
Electric Light			.60%
Side, Anti-Friction			.60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.....16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in... ℔ doz. 50
Grand Rapids All Steel Noiseless..50%
Ideal .....70&10%
Niagara.....1¾ in. 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern .....60@60&10%
Pitcher Spout.....80@80&5%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list)..50&10%
Barnes' Pitcher Spout.....80%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $7.20
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list) .....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$7.20
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	*3.85*	*5.00*	*6.00*

Punches—

Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality .....$1.75@2.00
Revolving (4 tubes)..... doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's No. 1 (A.B.C.), ℔ doz. $15.50%
No. 2, ℔ doz. $22.50.....50%
Hercules, each $7.50.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.41.....60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ in.	
$1.70	*$2.10*	*$3.00*	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$1.50	*$1.90*	*$2.60*	*100 feet.*

Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢.....30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail....℔ ft. 3¢
O. N. T. Rail.....2¾¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.70; 1¼ in., $4.40.
O. N. T., ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft. No. 201, $4.00; No. 202, $4.40.
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢..50%
None Better.....℔ ft. 3¾¢
Standard .....℔ ft. 4¢
Myers' Stayon Track.....60%
Richards' Mfg. Co.:
Common 1 x 3-16 in., $2.75; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail.....$4.40
Fire Door Track, ℔ ft., 2¼ x ⅝, 15¢; 3½ x ⅝, 9¢
Lag Screw Rail, No. 65.....40%
Gauge Trolley Track, ℔ ft., No. 31, 10¢; No. 32, 15¢; No. 33, 24¢.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail.....℔ ft. 1¾¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....℔ ft. 3¢
Wrought Bracket, 1¼ x 5-16..℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢.....60%
P. L. B. Steel Rail.....℔ 100 ft. $3.00
No. 0, 1 x 3-16.....℔ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn....$2.25
Fort Madison Blue Head Lawn....$2.50
Jackson Lawn, 29 and 30 teeth, ℔ doz., net.....$4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.....75
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00....75&25
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60.....
Anticlog Lawn, ℔ doz.....$3.00
Malleable Garden.....70&10
Kohler's:
Lawn Queen, 20-tooth.....℔ doz. $3.45
Lawn Queen, 24-tooth.....℔ doz. $3.60
Paragon, 20-tooth.....℔ doz. $2.75
Paragon, 24-tooth.....℔ doz. $3.00
Steel Garden, 14-tooth....℔ doz. $2.88
Malleable Garden, 14-tooth, ℔ doz. $1.75
Weldless Steel Garden.....75&5

Rasps, Horse—

Disston's 75
Heller Bros. .....70&5@70&10&10%
McCaffrey's American St'd...60&10&5
New Nicholson.....70&10@75
See also Files.

Razors—

Borasic 60%
Fox Razors, No. 42..℔ doz. $20.00
Fox Razors, No. 44..℔ doz. $20.00
Fox Razors, No. 82, Platina... ℔ doz. $25.00
Red Devil.....60%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¾, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20
Aluminum, German Silv., Bronze.25
1240 N, 124 N.....20
3004 N, 06 N, 6 RM, G 9.....25
4 N, 6 PN, 24 N, 26 PN.....20
2904 P.....33⅓
2904 PN.....33⅓
0924 N.....33⅓
02084 N.....33⅓
002904 PN.....33⅓
802 N.....33⅓
986 PN, 2904 N, 974 PN.....25
5009 PN, 5009 N.....20
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20
304 P, 304 PN, 00304 P, 00304 PN.33⅓

Registers—*List July 1, 1903.*

Black Jap.....75%
Bronzed 75%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.85
Double Action, 44 caliber....$2.00
Automatic $3.45
Hammerless $4.00
NOTE.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in.....per doz. $2.25@$2.50
17 in.....per doz. $2.50@$2.75
18 in.....per doz. $2.75@$3.00

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.00*	*1.15*	*1.40 doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2¼ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron..... doz. 50@55¢
Hill's Ringers, Malleable Iron.. doz. 70@75¢
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper .....50&10@60%
Iron or Steel.....75@75&5%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....72¢
Cronk's Brinkerhoff.....90¢
Lane's Stay.....40
Richards' Stay:
Handy Adj. and Reversible No. 53.50%
O. K. Adj. and Reversible No. 58.50%
Lag Screw, Nos. 55 and 57.....50
Fire Door, No. 59.....40
Favorite, No. 54.....40%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure .....lb..11¾@12¢
Sisal, 7-16 in. diam. and larger:
Mixed .....lb.,8@8¼¢
Pure .....lb.,9½@9¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed .....lb.,8@8¼¢
Pure .....lb.,9½@9¾¢

Sisal, Tarred, Medium Lath Yarn:
Mixed ..... *lb.* 7⅞¢
Pure ..... *lb.* 9@9½¢
Cotton Rope: Lb.
Best, ¼-in. and larger ..... 16½¢
Medium, ¼-in. and larger ..... 14½¢
Common, ¼-in. and larger ..... 10½¢
Jute Rope:
Thread No. 1, ¼-in. & up. lb. 6½¢
Thread No. 2, ¼-in. & up, lb. 5¾¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—
Galvanized ..... 42½&2½%
Plain ..... 50&2½%

Ropes, Hammocks—
Covert Mfg. Co.:
Jute ..... 50&5%
Sisal ..... 35&5%
Covert Saddlery Works ..... 60&5%

Rules—
Boxwood ..... 60&10&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@40&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35@35&10&10%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band ..... 50&10@60%
Cross Cuts ..... 35&5%
Mulay, Mill and Drag 50%
One-Man Saw 40%
Wood Saws 40%
Hand, Compass, &c 40%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&5%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 14 in. wide 60%
Band, ¾ to 1¾ 60%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws ..... 35&5%
Framed Wood Saws 30%
Hand Saws ..... 20&2½%
Wood Saw Blades 35%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws 35%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 50%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c ..... 25@25&7½%
Wood Saws ..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws ..... 40&10@50%
Butcher Saws Blades ..... 35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saws—
Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best 25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades 40%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades 35%
Diamond Hack Saw Frames 50%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades 35%
Sterling Hack Saw Frames ..... 30&10&5%

Scroll—
Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $4.00 ..... 15&10%

Scalers, Fish—
Covert's Saddlery Works ..... 60&10%

Scales—
Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. ..... *doz.* $5.50
Two Platforms, ½ oz. to 8 lbs. ..... *doz.* $16.00
Union Platform, Plain. $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective" ..... 25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list) 50%
Wagon or Stock (reduced list) ..... 25@35%
"The Standard" Portables 50%
"The Standard" R. R. and Wagon 50%

Scrapers—
Box, 1 Handle ..... *doz.* $2.00@2.25
Box, 2 Handle ..... *doz.* $2.60@2.85
Ship ..... *Light, $2.00; Heavy, $4.50*
Adjustable Box Scraper (S. R. & L. Co.), $6.00 ..... 30@30&10%
Chapin-Stephens Co., Box ..... 50@50&10%

Screens, Window and Frames—
Flyer Pattern Screens ..... 60&5@60&5&2½%
Maine Screen Frames ..... 40&10&5%
Perfection Screens ..... 60&5@60&5&2½%
Phillips' Screen Frames ..... 60&5@60&5&2½%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech. doz. 30@30&5%
Hand, Wood ..... 30@30&5%
R. Bliss Mfg. Co., Hand ..... 30@30&10%
Chapin-Stephens Co., Hand ..... 30@30&10%
Ohio Tool Co., Bench and Hand 30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 ..... 75&20%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&15%
Hand Rail, list Jan. 1, '81 ..... 70&10@75%

Jack Screws—
Standard List ..... 75&10@80&5%
Millers Falls ..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P. S. & W ..... 50@50&5%
Sargent ..... 70&10%
Swett Iron Works ..... 75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron ..... 50@50&10%
Flat or Round Head, Brass ..... 50@50&10%

Set and Cap—
Set (Iron or Steel) ..... 80@80&10&10%
Sq. Hd. Cap ..... 75@75&10%
Hex. Hd. Cap ..... 75@75&10%
Rd. or Fillister Hd. Cap ..... 65@65&10%

Wood—
List July 23, 1903.
Manufacturers' printed discounts:
Flat Head, Iron ..... 87½&10@...%
Round Head, Iron ..... 85 &10@...%
Flat Head, Brass ..... 85 &10@...%
Round Head, Brass ..... 80 &10@...%
Flat Head, Bronze ..... 77½&10@...%
Round Head, Bronze ..... 75 &10@...%
Drive Screws ..... 87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
Per doz.
Prices announced for next season:
Clipper Pattern, Grass $6.20
Full Polished, Clipper $6.75
Grain $8.00
Clipper, Grain $8.25
Weed and Bush $6.25

Seeders, Raisin—
Enterprise ..... 25@30%

Sets— Awl and Tool—
Brad Awl and Tool Sets:
Wood Handle, 10 Awls ..... *doz.* $2.00@2.25
Wood Handle, 14 Awls, 6 Tools ..... *doz.* $2.50@2.60
Aiken's Sets, Awl and Tools:
No. 20, ℔ doz. $10.00 ..... 50&10&10%
Fray's Adj. Tool Handles. Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles. No. 1, $12; No. 4, $12; No. 5, $18 ..... 15&10%
Stanley's Excelsior:
No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 30@30&10&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Nail—
Square ..... *per gro.* $2.25@2.50
Round, Blk. and Pol., assorted, gro. $1.80@2.00
Octagon ..... *gro.* $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ℔ gro. $12 ..... 25%
Mayhew's ..... ℔ gro. $9.00
Snell's Cannon's Diamond Point ..... ℔ gro. $7.20
Snell's Cor'gated, Cup Pt. ..... ℔ gro. $7.20
Snell's Knurled, Cup Pt. ..... ℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—
Regular list ..... 75@75&10%

Saw—
Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut 30%
Plate 20%
Disston's Star and Monarch 25%
Morrill's No. 1, $15.00 ..... 50%
Nos. 3 and 4, Cross Cut, $20.63 ..... 50%
No. 5, Mill, $30.00 ..... 50%
Nos. 10, 11, 95, $15.63 ..... 50%
No. 1 Old Style, $10.00 ..... 50%
Special, $16.25 ..... 50%
Giant Royal, Cross Cut ..... ℔ doz. $8.50
Royal, Hand ..... ℔ doz. $5.00
Taintor Positive ..... ℔ doz. $6.75

Shaving
Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00

Sharpeners, Knife—
Chicago Wheel & Mfg. Co. 65%

Shaves, Spoke—
Iron ..... *doz.* $1.00@1.15
Wood ..... *doz.* $1.75@2.00
Bailey's (Stanley R. & L. Co.) ..... 30@30&10&10
Chapin-Stephens Co. ..... 30@30&10&10
Goodell's ℔ doz. $9.00 ..... 15&10%
Wood's F1 and F2 ..... 50%

Shears—

	7	8	9 in.
Cast Iron ..			
Best	$16.00	18.00	20.00 gro.
Good ...	$13.00	15.00	17.00 gro.
Cheap ..	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality, Jap ..... 70@40&10%
Best quality, Nickel ..... 60@60&10%
Fair quality, Jap ..... 80@80&5%
Fair quality, Nickel ..... 75@75&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5
Heinisch's Tailor's Shears 10
Wilkinson's Hedge, 1900 list 45%
Wilkinson's Branch, Lawn & Border 40%
Wilkinson's Sheep, 1900 list 50%

Tinners' Snips—
Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin, 40@40&10%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in. 50%
Niagara Snips 40%
P. S. & W. Co. 20%

Pruning Shears and Tools
Cronk's Grape Shears 33⅓%
Cronk's Pruning Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades ..... 40@40&5%
Orange Shears ..... 50&10@50&20
Grape ..... 40&10@50
Tree Pruners 75
P. S. & W. Co. 33⅓%

Sheaves—Sliding Door—
Stowell's Anti-Friction 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 60%
R. & E. list 33⅓%
Wrightsville Hatfield Pattern 80%

Sliding Shutter—
Reading list ..... 45&20%
R. & E. list 33⅓%
Sargent's list ..... 50&10%

Shells—Shells, Empty—
Brass Shells, Empty:
First quality, all gauges ..... 60&5%
Climax, Club, Rival, 10 and 12 gauge ..... 65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge. 25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge. 20%
Climax, Union, League, New Rival, 10 and 12 gauge 25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list) 20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge ..... 33⅓&5%
Robin Hood, Low Brass ..... 20&10%
Robin Hood, High Brass ..... 30&10%

Shells, Loaded—
Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass 50%
Comets, High Brass ..... 50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... per keg $4.00
Steel ..... per keg $3.75
Burden's, all sizes ..... ℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag $1.65
Drop, B and larger ..... *per 25-lb. bag,* $1.90
Buck, 25-lb. bag $1.90
Chilled, 25-lb. bag $1.90

Shovels and Spades—
Association List, Nov. 15, 1902 ..... 40%

Sieves and Sifters—
Hunter's Imitation ..... *gro.* $10.50@11.00
Hunter's Genuine ..... *per gro.* $12.00@12.50
Buffalo Metallic Blued, S. S. Co., ℔ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00 ..... 20%

Sieves, Seamless Metallic

	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire ..	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire ..	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... *doz.* $0.90@1.05
Mesh 20, Nested ..... *doz.* $1.00@1.05
Mesh 24, Nested ..... *doz.* $1.30@1.40

Sinks, Cast Iron—
Standard list ..... 60@60&10%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... 80&10@80&10&10%
Steel ..... 40@40&10%

Slates, School—
Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless .. 60&5 tens
Victor A, Noiseless ..... 60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... 40@40&10%
Covert Mfg. Co.:
Derby ..... 30&5&2%
High Grade 45
Jockey ..... 30&10
Trojan 45
Yankee ..... 30&5&2
Yankee Roller ..... 30&5&2
Covert's Saddlery Works:
Crown 60
German 60
Model 60
Triumph 60
Oneida Community:
Solid Swivel 60%
Sargent's Patent Guarded ..... 66⅔&10%

Snaths—
Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—Silver Plated—
Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous—
German Silver ..... 60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—
Teas ..... *per gro.* 45@50¢
Tables ..... *per gro.* $0.90@1.00

Springs—Door—
Chicago (Coil) ..... 40&10%
Gem (Coil) 20
Pullman (Coil) 20
Reliance (Coil) ..... 40&10%
Star (Coil) 30
Torrey's Rod, 39 in. ..... ℔ doz. $1.10
Victor (Coil) ..... 50&10&10%

Carriage, Wagon, &c.—

	Per lb
1¼ in. and Wider:	
Black	4@4¼¢
Half Bright	4@4¼¢
Bright	4½@4¾¢

Painted Seat Springs:
1½ x 2 x 26 ..... *per pr.* 42¢
1½ x 3 x 28 ..... *per pr.* 70¢

Sprinklers, Lawn—
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24 ..... 30%

Squares—
Nickel plated .. *List Jan. 5, 1900.*
Steel and Iron .. 75@75&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Sq. and T-Bevels 70%
Winterbottom's Try and Miter ..... 40&10@40&10&10%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz.* $1.00
Good Grade ..... *doz.* $1.25
Tinned Iron ..... *doz.* $0.75@1.25
Iron, Porcelain Lined ... *doz.* $1.75

Staples—
Barbed Blind ..... *lb.* 6@6½¢
Electricians' Association list .. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples ..... *per lb.* 3½@3½¢
Grand Crossing Tack Co.'s list .. 80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros.' 30
C. & A. Hoffmann's 40%

Steelyards— .... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock 25
Derby Screw Plates 25
Gardner Die Stocks No. 1 50
Gardner Die Stocks, larger sizes 40
Green River 25
Lightning Screw Plate 25%
Little Giant 25
Reece's New Screw Plates 25%

Stone—Scythe Stones—
Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots ..... ℔ gro. $9.00
One gross or more ..... ℔ gro. $7.20
Lots of 10 gross or more ..... ℔ gro. $6.00

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.00
Green Mountain S. S. ℔ gro. $6.00
Extra Indian Pond S. S. ℔ gro. $7.50
No. 1 Indian Pond S. S. ℔ gro. $7.00
No. 2 Indian Pond S. S. ℔ gro. $4.50
Leader Red End S. S. ℔ gro. $4.50
Emery and Corundum, 10 in. ℔ gro. $9.00
Pure Corundum, 10 in. ℔ gro. $12
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓% } 33⅓%

Oil Stones, &c.—

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit 50%
Gem Corundum Axe, Single or Double Grit 55%
Gem Corundum Slips 55%
Gem Corundum Razor Hones 50%
Pike Mfg. Co., 1901 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 30¢
Lily White Slips 90¢
Rosy Red Slips 90¢
Washita Slips, Extra 80¢
Washita Slips, No. 1 70¢
Washita Slips, No. 2 49¢
India Oil Stones (entire list) 33⅓
Quickcut Emery and Corundum Oil Stone, Double Grit 33⅓
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓
Quickcut Emery Rubbing Bricks 33⅓
Hindostan No. 1, R'g'lar. ℔ lb 8¢
Hindostan No. 1, Small. ℔ lb 10¢
Axe Stones (all kinds)
Turkey Oil Stones, Extra, 5 to 8 in. ℔ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips 40¢
Sand Stone 6¢
Belgian, German and Swaty Razor Hones 50%
Natural Grit Carving Knife Hones ℔ doz. $3.00
Quick Edge Pocket Knife Hones ℔ doz. $2.50
Mounted Kitchen Sand Stone. ℔ doz. $1.50
} 33⅓% } 40%

Stoners, Cherry—

Enterprise 25@30%

Stoppers, Bottle—

Victor Bottle Stoppers ℔ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ℔ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 60@60&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Cary's Universal, case lots 20&10&10%

Hame—

Covert's Saddlery Works 60&10%

Stretchers, Carpet—

Cast Iron, St'l Points. doz. 55@60%
Socket doz. $1.75
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%

Sweepers, Carpet—

National Sweeper Co.: ℔ doz.
Auditorium, Roller Bearing (26 in. case), Nickel $54.00
Mammoth, Roller Bearing (30 in. case), Nickel $60.00
Marion, Roller Bearing, regular finishes, full Nickel $24.00
Marion Queen, Roller Bearing, full Nickel $24.00
Monarch, Roller Bearing, N'kel $22.00
Monarch, Roller B'r'g, Jap'ned $20.00
Transparent, Roller Bearing, Plate Glass Top, Nickel $36.00
Monarch Extra, Roller Bearing, (17-in. case), Nickel $36.00
Monarch Extra, Roller Bearing (17-in. case), Japanned $33.00
National Queen, Fancy Veneers $27.00
Perpetual, Regular B'r'gs, Nkl. $20.00
Perpetual, Regular B'r'gs, Jap. $18.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks 90&30&10@..%
American Cut Tacks ..90&25@..%
Swedes Cut Tacks 90&30&10&5@..%
Swedes Upholsterers' Tacks .... 90&45&10&5@..%
Gimp Tacks 90&45&10@..%
Lace Tacks 90&45&10@..%
Trimmers' Tacks .90&30&10&5@..%
Looking Glass Tacks 70&10&5@..%
Bill Posters' and Railroad Tacks 90&45&10@..%
Hungarian Nails ....80&30&5@..%
Common and Patent Brads ... 80&10&5@..%
Trunk and Clout Nails .80&10@..%

NOTE.—The above prices are for Straight Weights. An extra 5% is given on Star Weights** and an extra 10&5% on Standard Weights.****

Miscellaneous—

Double Pointed Tacks ..... 90&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list 50&10@60%
See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, S., S. & Co.	30-gal. $3.40
Emerald, S., S. & Co.	60-gal. $4.25
Queen City, S., S. & Co.	30-gal. $3.65
Queen City, S., S. & Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin ..40¢10@50%
Patent Leather .....25@30&5%
Steel .....40@40&10%
Chesterman's .....25@25&5%
Eddy Asses' Skin .....40&10@50%
Eddy Patent Leather .....25@30&5%
Eddy Steel .....40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin .....40&10@50%
Favorite, Duck and Leather ..... 25&5@25&10%
Metallic and Steel, lower list ..... 35@35&5%
Pocket .....35@35&5%
Lufkin's:
Asses' Skin .....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather ....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $3.00

Thermometers—

Tin Case .....80¢10@80¢10¢5%

Ties, Bale—Steel Wire—

Single Loop .....80¢2½%
Monitor, Cross Head, &c. 70%

Brick Ties—

Niagara Brick Ties .....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works .....60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White .....20@20&5%

Hay—

Myers' Hay Tools 50%
Stowell's Hay Carriers 50%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 50%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. ....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Oneida Pattern ..75¢10@75&10¢5%
Newhouse .....45@45&5%
Hawley & Norton 65%
Victor and Oneida .....70&10@70&10&5%
O. C. Jump (Blake Pat.) ..60&5@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ℔ doz. $13.25
No. 3, Rat, ℔ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ℔ gro. $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I 50%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ℔ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ℔ gro. $6.00
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Rose Brick and Plastering .....25&5%
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern .....50&10%
Western Pattern .....60&10%
Handy Trucks ℔ doz. $16.00
Grocery ℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern ℔ doz. $ 8.50
McKinney Trucks each $10.00
Model Stove Trucks ℔ doz. $18.50

Tubs, Wash— *No. 1 2 3*

Galvanized, per doz. $4.75 5.25 6.00
Galvanized Wash Tubs (S., S. & Co.):
No. 1 2 3 10 20 30
Per doz., net $5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*22@24¢*	
No. 12, ¼ and ½-lb. Balls	*18@20¢*	
No. 18, ¼ and ½-lb. Balls	*16@18¢*	
No. 24, ¼ and ½-lb. Balls	*16@18¢*	
No. 36, ¼ and ½-lb. Balls	*15@17¢*	
Chalk Line, Cotton Balls	½-lb.	*30¢*
Cotton Mops, 6, 9, 12 and 15 lb. to doz.		*9½@11¢*
Cotton Wrapping, 5 Balls to lb., according to quality		*13½@20¢*
American 2-Ply Hemp, ¼ and ½-lb. Balls		*13@14¢*
American 3-Ply Hemp, 1-lb. Balls		*13@14¢*
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)		*8¢*
India 3-Ply Hemp, 1-lb. Balls..		*7@8¢*
India 3-Ply Hemp, 1½-lb. Balls.		*6@7¢*
2, 3, 4 and 5-Ply Jute, ½-lb. Balls		*9@10¢*
Mason Line, Linen, ½-lb. Bls.		*46¢*
No. 26 Mattress, ¼ and ½-lb. Balls		*37¢*
Wool, 3 to 6 ply....B 4¾¢; A 5¢		

Vises—

Solid Box .....60¢10@60&10¢10%

Parallel—

Athol Machine Co.: 40%
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50; No. 3, $10.00.
Machinist and Tool Makers' No. 4, $12.50; No. 5, $7.00; No. 6, $10.00; No. 10, $21.50.
Jewelers' No. 7 .....$4.00
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5&70%
Lewis Tool Co. .....20&30%
Merrill's 20%
Millers Falls .....60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip 20%
Parker's:
Victor .....20@25%
Regulars .....20@25%
Vulcan's .....40@45%
Combination Pipe .....55@60%
Prentiss .....20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists' 40%
Jewelers' 33⅓%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz. $30 25%
Perfection Saw Clamps, ℔ doz. $5.00
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 .....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip 15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series 60%
187 Series .....60&5%
No. 870 .....40%

Wads—*Price per M.*

B. E., 11 up .....60¢
B. E., 9 and 10 .....70¢
B. E., 8 .....80¢
B. E., 7 .....80¢
P. E., 11 up $1.00
P. E., 9 and 10 ..... 1.25
P. E., 8 ..... 1.50
P. E., 7 ..... 1.50
Ely's B. E., 11 and larger .$1.70@1.75
Ely's P. E., 12 to 20 ....$3.00@3.25
} Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....50@55&10%
Ground .....55@60&10%
Plain or Unground ..60@65&10%
Country Hollow Ware, per 100 lbs. .....$2.75@3.00
White Enameled Ware:
Maslin Kettles 70%
Covered Wares
Tinned and Turned 40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware .....50&20%
Agate Nickel Steel Ware, Specials.. 60&15%
Iron Clad Ware .....70&10%
Lava, Enameled .....40&10%
Never Break Enameled 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles 60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.90
Cable Cross, family size, stationary protector $3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back $2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.25

Washers—Leather, Axle—

Solid .....80¢10@80¢10¢10%
Patent .....90¢@90¢5%
Coil: ⅞ 1 1¼ 1¼ *Inch.*
10¢ 11¢ 12¢ 13¢ *per box*

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ...$4.95 4.05 2.75 2.55 2.35
In lots less than one key add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... *per lb. 1½@2¢*

Wedges—

Oil Finish .....*lb. 2.15@2.30¢*

Weights—Hitching—

Covert Mfg. Co. .....40&2%
Covert's Saddlery Works .....60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District $25.00
Southern Territory ..$19.00@20.00
Western and Central Districts .....$20.00@21.00

Wheels, Well—

8-in., $1.50@1.55; 10-in., $1.65@1.70; 12-in., $2.25@2.35; 14-in., $3.40@3.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 .....80¢5@80¢7½%
10 to 18 .....80¢@80¢5%
19 to 26 .....80¢10@80¢10¢5%
27 to 36 .....80¢5@80¢10%
Galvanized:
6 to 9 .....77½@77½¢5%
10 to 14 .....72½@72½¢5%
15 to 16 .....75¢7½@75¢10¢2½%
19 to 26 .....75¢5@75¢10%
27 to 36 .....72½¢5@72¢7½%
Coppered:
6 to 9 .....77½@77½¢5%
10 to 14 .....77½@77½¢7½%
15 to 18 .....75¢10@75¢10¢2½%
19 to 26 .....75¢10¢5@80%
27 to 36 .....75@75¢5%
Tinned:
6 to 14 .....77½@77½¢7½%
15 to 18 .....75¢5@75¢10%
Annealed, Steel and Tinned, on Spools ..70¢10¢10@70¢10¢10¢10%
Brass and Copper on Spools... 60¢10@60¢10¢10%
Brass, list Feb. 26, '96 .....30¢5%
Copper, list Feb. 26, '96 .....15%
Cast Steel Wire 50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903 .90¢10¢10¢10@..%

Wire Cloth and Netting—

Galvanized Wire Netting ..... 80¢15@80¢17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft.3 ¢
Nos. 4 and 5 Mesh, sq. ft..3½¢
No. 6 Mesh, sq. ft .....3½¢
No. 8 Mesh, sq. ft .....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....75¢10@75¢10¢10%
Alligator or Crocodile..70¢10@75%
Baxter Pattern S Wrenches.... 70¢5@70¢10%
Drop Forged S .....45@45¢5%
Acme .....60&10%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S. 40%
Adjustable S Pipe 40%
Bemis Pipe 60%
Briggs Pattern 40%
Combination Black .....40&5%
Combination Bright 40%
Merrick Pattern 50%
Boardman's 33⅓%
Coes' Genuine Knife Hdl..40&10&5&5
Coes' Genuine Steel Hdl..40&10&5&5
Coes' Genuine Key Model..40&10&5&5
Coes' "Mechanics'" ...40&10&10&5&5
Donohue's Engineer .....40&10%
Eagle .....50&10%
Elgin Wrenches 40%
Elgin Monkey Wrench Pipe Jaws.33⅓%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots .....50&5%
Less than case lots 50%
Improved Pipe (W. & B.) 60%
Solid Handles, P., S. & W..50@50&5%
Stillson 65%
Vulcan Chain 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '02 .....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' .....list net

Zinc—

Sheet .....*per 100 lbs. $7.75@8.00*